SOVIET ECONOMY

PLANS PROBLEMS PROSPECTS

1966-1970

Soviet Economy

Plans Problems Prospects

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From the Editors

We offer in this book on the Eighth Five-Year Plan of the economic development of the USSR in 1966-70, articles by N. Baibakov, Chairman of the State Planning Committee of the USSR, Y. Liberman, Soviet economist, I. Malyshev, Deputy Chief of the Central Statistical Board of the USSR, and other noted statesmen, executives in industry, trade and finance, economists and experts in planning. These articles have been published in the Soviet press.

The Directives for the Eighth Five-Year Plan were approved by the 23rd Congress of the Communist Party of the Soviet Union in April 1966, almost 40 years after the 15th Congress of the CPSU had approved the Directives for the First Five-Year Plan.

Ever since then the nations of the world have attentively followed the progress of the Soviet five-year plans, and the system of national economic planning developed in the USSR has become the object of profound study by economists of the most diverse schools. Moreover, the Soviet planning system has now many imitators. The know-how of the USSR and other socialist countries in planning is now being applied by developing countries. Some capi-

talist states too are seeking to make use of it in their own way. Of course, all the advantages of economic planning on a national scale cannot be realised in an economy based on private ownership. Be that as it may, the Soviet planning system has won universal recognition.

This is fully understandable. Soviet long-term plans are a forecast based on exact calculation and scientific analysis. To see far ahead means to advance with confidence. The planning system, as it were, has provided the Soviet economy with seven-league boots, and it is swiftly advancing at a pace without precedent in history. This is amply demonstrated by figures. In 1965, the Soviet Union generated 507,000 million kwh of electricity, 101 times more than in 1928, the last year before the launching of the five-year plans. During this period the production of steel and oil extraction rose 21 times, cement, 39 times, metal-cutting machine tools, 93 times. The average annual output of agriculture increased 2.5 times. In the last 25 years only the real incomes of factory and office workers rose by 124 per cent and those of collective farmers, by 200 per cent.

The Soviet economy advanced rapidly in the seven years from 1959 to 1965. The fixed assets the USSR had in 1958 were built up during more than 40 years, and, if we deduct the time taken up by wars, in 32 years. In the next seven years the USSR almost doubled its fixed assets. In other words, it created as much material wealth as in the preceding 32 years. The rate of Soviet economic development grew more than fourfold.

The economy will advance even more rapidly under the new, the Eighth, Five-Year Plan. Total output will rise more than 7 per cent annually on the average, as compared with slightly more than 6 per cent in the preceding five years. Moreover, the material wealth equivalent of one per cent grows bigger with each passing year. In 1928, when the Soviet Union was preparing for the First Five-Year Plan, a one per cent increase in total industrial output amounted (in comparable prices) to 50 million roubles, while in 1958 it reached 1,200 million roubles. In the five-year period the average actual rise in industrial output will amount to 22,000-23,000 million roubles annually as against 15,800 million roubles in the preceding five years.

The Five-Year Plan rests on a solid economic and scientific basis. Its assignments are based on the rising requirements of Soviet society and the real possibilities for expanding production.

The Eighth Five-Year Plan is distinguished by its broad scope and exact calculations. The decisive requirements for its fulfilment are the acceleration of scientific and technological progress, development and improvement of the methods of guiding the economy, and the provision of greater material incentives for workers, peasants and intellectuals. Modern technological facilities will play an ever greater part in directing the Soviet economy.

The book explains the content of the new Five-Year Plan and the scientific nature of Soviet planning. It demonstrates the methods of carrying out the plan and of eliminating the

shortcomings that still exist in guiding the economy, and the role of the planning system in building the Soviet economy and raising the people's living standards.

GLOSSARY OF SOME TERMS

1. *Khozraschot*—an abbreviation of *Khozyaistvenny Raschot*. The closest equivalent in English is cost accounting. An enterprise operating on a *khozraschot* basis keeps an account of all outlays which are covered by its income while leaving a margin of profit. In some cases, as in the organisation of new production, the working of poor deposits, etc., an enterprise may operate for a time at a loss, but it keeps an account of all outlays, which are covered by its income plus the planned subsidy.
2. *Departments I and II*—two groups of material production. Department I consists of sectors producing means of production and Department II of sectors producing consumer goods.
3. *Group A*—industries which produce means of production.
4. *Group B*—industries which produce consumer goods.
5. *Productive assets*—the fixed and circulating assets of an enterprise. *Fixed assets* are made up of buildings, machinery, equipment, tools, transport facilities and other means of labour used for a long period. *Cir-*

culating assets consist of stocks of raw materials, semi-manufactures, fuel, uncompleted production, uncompleted construction.

6. *Fund of an enterprise*—is made up of part of the profit that is received by the enterprise.
7. *Incentive funds*—part of the profit of an enterprise which it retains for the payment of bonuses to the personnel.
8. *Asset-output ratio*—an indicator showing the value of fixed assets needed for the production of a unit of output, say, a ton of metal, 100 metres of fabric, etc. The lower this ratio, the better.
9. *Output-asset ratio*—an indicator showing the return yielded by fixed assets and the efficiency of their use.
10. *Calculating prices*—prices set for enterprises operating in worse conditions than the average, where the outlays of labour and resources exceed the socially necessary norms. Calculating prices ensure normal profitability of such enterprises. The difference between the price and the cost of production is covered by the state, while the consumer gets the goods at one price.
11. *USSR Gosplan*—an abbreviation of Gosudarstvenny Planovy Komitet, the State Planning Committee of the USSR.
12. *Republican Gosplan*—State Planning Committee of a Union Republic.
13. *Consumers Co-operatives*—one of the main forms of trade in the USSR, chiefly in the countryside. They account for 28 per cent of the country's total retail trade.

FORESIGHT AND ACCURATE CALCULATION

The Main Tasks of the New Five-Year Plan

N. BAIBAKOV, *Chairman, State Planning Committee of the USSR*

The main economic task of the Soviet Union's Eighth Five-Year Plan (1966-70) is "to secure—through the utmost application of the achievements of science and technology, the industrial development of the whole of social production, and the enhancement of its efficiency and higher labour productivity—a considerable growth of industry and stable high rates of agricultural development, thereby achieving a substantial rise of living standards and fuller satisfaction of the material and cultural requirements of all Soviet people." This main task of the Five-Year Plan is spelled out in its basic targets: the national income will increase by approximately 40 per cent, the gross industrial product will rise by 50 per cent, the annual

average volume of all farm produce is to increase by 25 per cent as compared with the preceding five-year period, capital investments in the national economy are to rise by 47 per cent, labour productivity in industry will be increased by 33-35 per cent, in construction by 35-40 per cent and in agriculture by 40-45 per cent. The growth rate of the people's real incomes will rise from 20 per cent in 1961-65 to 30 per cent in 1966-70. Retail sales rose 34 per cent in the previous plan but in the current plan the increase will be 43.5 per cent. The volume of housing construction will rise from 300 million square metres of floorspace to approximately 400 million. The increment of the consumption fund will be 70 per cent greater than in the preceding five-year period.

The new Five-Year Plan is based on the country's greatly enhanced economic potential, on the latest achievements in science and technology, on a more powerful industrial structure and on substantial increases in surveyed natural resources. The Soviet Union now possesses considerably greater economic possibilities for the further powerful development of all branches of the national economy.

RATES AND PROPORTIONS

The more rapid development of branches manufacturing consumer goods as a basis for narrowing the gap between the production of consumer goods and that of producer goods is an essential feature of the new Five-Year Plan.

The marked lag in consumer goods production over the past ten years resulted in a serious violation of basic economic proportions. The next five years will substantially alter the national economic proportions in favour of consumer goods production. The average annual growth rates in the output of Group A and Group B industries are illustrated by the following table.

per cent

	1956—60	1961—65	1966—70
Group A	11.3	9.6	8.7
Group B	8.5	6.3	7.7
Ratio of Group B to Group A	75	66	89

The figures in the table testify to the more effective use of the means of production with simultaneous development of all branches of industry, agriculture, construction and transport. The improvement of this national economic proportion will create the material conditions for effecting the substantial rise in living standards envisaged by the new Five-Year Plan. Accelerated development of consumer goods production will ensure a sizable increase in the volume of socialist accumulation, which is especially important today when the principle of material stimulation is being extensively applied in all branches. Approximation of the output growth rates of Group A and Group B will be ensured in the main by creating a stable raw material base for the light and food indus-

tries, by accelerating the rate of consumer goods output and increasing their share in the output of heavy industry, and by manufacturing more means and instruments of labour both for agriculture and for consumer goods industries.

The improvement of proportions between production of the means of production and consumer goods output is primarily dependent upon *overcoming the lag in agriculture and bringing the rate of its development closer to the rate of industrial development.* It is planned to create the necessary material and technical prerequisites for the solution of this task. Agriculture will be provided with huge material and financial resources. In the five years, the collective and state farms will receive about 1,800,000 tractors, 1,100,000 lorries and many other farm machines and equipment. The supply of mineral fertilisers will nearly double and will reach 55 million tons in 1970; the consumption of electric power will go up to 65,000 million kwh, which is approximately a threefold increase. Capital investments in agriculture will amount to 41,000 million roubles—double the figure for the preceding five-year period. In addition to capital investments by the state, the collective farms are expected to invest, out of their own funds and with the help of state credits, 30,000 million roubles in the expansion of their economy. The share of state allocations for agricultural development in the total volume of capital investments will increase to 17.4 per cent, as against 11.3 per cent in 1959-65.

More rapid development of agriculture and the growing output of chemical products will

provide favourable conditions for increased output of consumer goods. The output of the light and food industries will rise by approximately 40 per cent in the five-year period. The range and variety of consumer goods will be considerably enlarged and their quality improved. Per capita consumption of meat and meat products will increase by 20-25 per cent, milk and dairy products by 15 to 18 per cent, sugar by 25 per cent, vegetable oils by 40-46 per cent, fabrics, clothing and knitted wear by 40 per cent. The rapid increase in light and food industry output will require considerable investments in these branches, especially in the light industry, where the volume of capital investments will increase 2.3-fold over the five years.

All this does not mean that less attention will be devoted to heavy industry, which has been and remains the leading and decisive branch, ensuring a steady and rapid growth of the country's economy and the strengthening of its defence capacity. An important distinctive feature of the Five-Year Plan is the *enhanced role of heavy industry in the further advancement of the people's well-being*. The share of the means of production in branches manufacturing consumer goods will increase substantially and amount to 20 per cent by 1970. This will make it possible largely to replace the obsolete equipment of low productivity in the light and food industries with up-to-date, highly efficient machinery and thus eliminate disproportions between individual branches, which, in turn, will make for accelerated growth of production and higher quality standards.

Much importance is attached to improving the assortment of consumer goods. With an overall increase in the output of consumer goods averaging 43-46 per cent, their output by heavy industry enterprises is planned to expand by 80 per cent. Substantial increases in the output of household articles by enterprises of the engineering, metallurgical, chemical, building materials, timber, pulp-and-paper, woodworking and other industries are also planned.

As to heavy industry, the development of its major branches will proceed at high rates. In the five years, the generation of electric power is to go up roughly by 70 per cent, reaching 830,000-850,000 million kwh in 1970. This will permit us to increase the amount of electric power in industry by 50 per cent, and by 200 per cent in agriculture. The extraction of oil will rise by 46 per cent and of gas approximately 86 per cent. The share of gas and oil in the overall production of fuel is to increase to 60 per cent, as compared with 52 per cent in 1965. The output of coal will reach 665-675 million tons in 1970, with the mining of coking coals for the iron and steel industry proceeding at higher rates. The proportion of coal mined by the open-cast method will account for approximately 28 per cent of the total output in 1970.

Particular attention is devoted to the metallurgical industry. The output of steel will increase to 124-129 million tons, or approximately by 41 per cent, the output of rolled goods to 95-99 million tons (38 per cent) and of piping to 14-15 million tons (61 per cent). The plan pro-

vides for a much better and wider assortment of metals and for increased output of cold-rolled sheet stock, transformer steel, pipes, steel wire, high-precision shaped goods. Priority development will be given to the production of light metals, copper, rare metals and alloys. The production of aluminium will increase 100 per cent and of copper, 70 per cent. The output of nickel, titanium and other non-ferrous, rare and precious metals is to be expanded considerably.

The high rate of development of the chemical industry will make it possible further to intensify agricultural production, increase the output of consumer goods and accelerate technological progress in other branches. The output of the chemical industry will double in the five years. The production of mineral fertilisers will reach 62-65 million tons a year. The output of plastics will rise by approximately 180 per cent. To enable the chemical industry to cope with its big and complex tasks, capital investments in this branch will be doubled compared with the preceding five-year period.

The development of engineering will continue at an accelerated pace. The targets fixed in the plan are aimed at ensuring the equipment of industry and agriculture with new, high-productive and economical machines, instruments and devices corresponding to the latest achievements of science and technology. It is planned to increase the output of the engineering and metalworking industries by approximately 60-70 per cent, with priority development given to such branches as radioelectron-

ics, instrument-building, machine tools and equipment for the metallurgical, chemical, oil and gas industries. The output of technological equipment for the light and food industries will increase substantially.

An immense volume of capital construction amounting in value to nearly 310,000 million roubles will have to be carried out in the five-year period to ensure the planned economic development and improvement in national living standards. Accordingly, a number of important measures will be taken to improve the organisation of capital construction, to step up the output of building materials and to strengthen the material and technical base of construction.

FIVE YEARS OF MAXIMUM EFFECT

The maximum increase of the efficiency of social production is a cardinal task of the Five-Year Plan. This is the only condition for developing the economy at a higher rate with minimum outlays. Unfortunately, the results of economic development for the past ten years testify to a certain decline in the efficiency of social production. Despite the high and stable average annual rates of increase in the fixed assets, which amounted to approximately 10.4 per cent in the past decade, the rates of growth of the national income used for consumption and accumulation declined from 8.2 per cent in 1956-60 to 6 per cent in the preceding five-year period. Gross output per rouble of the fixed

assets declined both in industry and in agriculture.

The Soviet Union has wide opportunities to raise the efficiency of social production in all spheres of the national economy by making more rational use of fixed assets, accelerating technological progress, reducing the period and bringing down the cost of construction, ensuring thrifty and economical use of material and manpower resources, raising the quality of output, securing more rational distribution of the productive forces and, lastly, by improving the structure of foreign trade. We shall briefly examine some of these opportunities.

Higher efficiency of social production largely depends on the rational and effective use of production assets. It has to be admitted, however, that the use of production assets in the past seven years was at an extremely low level in a number of branches. Thus, in the coal industry fixed assets increased 50 per cent but output rose only 25 per cent; the respective figures for the light industry were 80 and 37 per cent, and for the chemical industry 250 and 150 per cent. Inadequate use of fixed assets prevented these and certain other branches from fulfilling their targets, which meant a loss of a sizable quantity of products for the country. How important the growth of the output-asset ratio is can be judged from the fact that an increase in gross output per rouble of fixed assets by only one per cent will yield 3,000 million roubles worth of additional industrial products by 1970. That is why especial importance should be attached to the problem of raising the output-asset ratio

and making more intensive use of production assets.

Tentative estimates show that the output-asset ratio of production assets operating on January 1, 1966, will rise between 12 and 15 per cent by the close of the five-year period. This is to be achieved by improving the technology and organisation of production, more effective utilisation of existing capacities and equipment, and elimination of bottlenecks in production.

Another important task is *to accelerate the commissioning of new production capacities.* The delayed commissioning of new plant during the past seven years caused heavy losses to the state.

Higher efficiency of social production depends on *accelerated technological progress,* on the rate of the technical re-equipment of the national economy. That explains the paramount importance attached in the Five-Year Plan to more extensive and rapid introduction of new equipment, progressive technology and new materials in production, as well as to the higher scientific organisation of labour with a view to increasing its productivity.

An important trend in the development of all sectors of industry is the equipment of enterprises with machines of increased capacity with a view to reducing relative investments, cutting down production costs and, consequently, enhancing the efficiency of production.

Suffice it to say that the growth of the power industry based on the construction of large thermal plants equipped with powerful generat-

ing units will make it possible to reduce the relative cost of newly commissioned capacities and effect a saving of approximately 650 million roubles in the five years. It will also save not less than 40 million tons of fuel (in conventional units).

Considerable economies can be obtained by the use of large-diameter pipes for the pumping of oil and especially of gas. The maximum diameter of pipes now used in the construction of main gas pipelines does not exceed 1 metre. It would require 5 pipelines of such diameter, involving the expenditure of 4.5 million tons of metal, to carry 50,000 million cubic metres of gas a year from the north of Tyumen Region to the central areas of the country over a distance of 3,000 kilometres. If the metal workers quickly master the production of large-diameter (1.4 metre) pipes, then only two pipelines will be needed to carry the same amount of gas, which will mean a saving of at least 1.2 million tons of metal and of many millions of roubles.

The successful introduction of the latest scientific and technical achievements in production largely depends on the strengthening of research organisations and on their close ties with production. That is why in drawing up the Five-Year Plan the USSR State Planning Committee, the USSR Academy of Sciences, the Ministries and departments mapped out a series of measures to intensify scientific research in the most promising scientific and technological fields, to establish and to extend direct contacts between research institutions and enterprises, to ensure more rapid practical testing of

research results and their speediest possible application in production. Of great importance in this connection will be a system of material incentives to stimulate the speediest and most economical application of the results of research.

Another means of raising the efficiency of production is higher quality standards. The significance of this problem can hardly be overestimated.

The effort to achieve the highest possible quality of output must become the keynote of the five-year programme, for it will help to bring out vast latent reserves. Much has been done in recent years to improve the quality of output in a number of branches. A graphic illustration of this is provided by the aircraft industry, whose enterprises have succeeded in improving the quality, increasing the reliability and lengthening the service life of machines during the past 3 or 4 years. Thus, the operation life of aircraft engines increased three to fourfold, which released substantial capacities at motorbuilding plants without in any way affecting the uninterrupted supply of aircraft engines to the national economy, and considerably reduced material and labour outlays. The engines produced in 1963-65 brought about a saving of 2,500 million roubles.

However, in industry as a whole the work of improving quality standards is conducted on a patently inadequate scale. The quality of many manufactured goods leaves much to be desired, their technical and economic indices are still below the best Soviet and foreign standards.

The Five-Year Plan provides for extensive measures to improve the quality and enlarge the assortment of products in all branches. One of the tasks of paramount importance is rapidly to replace obsolescent products by new and better ones, to raise the productivity, efficiency, reliability and service life of machines, equipment and instruments.

The 23rd CPSU Congress Directives mapped out the main trends in siting the country's productive forces so as to increase considerably the economic role of the Eastern areas and of the Central Asian Republics. In the East where there are cheap fuel and power resources, there is to be an accelerated development of fuel production, of the output of electric power and of non-ferrous and chemical products that are especially power-consuming. The rapid development of the timber and pulp-and-paper industry will be based on the abundant timber resources of Siberia and the Far East. Natural resources in the Eastern areas will be developed mainly by integrated industrial complexes.

It is well known that the development of the productive forces in Siberia and the Far East is hampered by the shortage of manpower. That explains why the Plan provides for *higher rates of growth of material and cultural standards in these areas than in the European part of the country* and increases the amount of capital investments in construction of dwellings, schools, hospitals, kindergartens, nurseries and other cultural, communal and public service institutions.

More rational distribution of the productive

forces will result in a certain reduction of the average length of freight carriage and a consequent improvement of proportions between the growth of industrial and agricultural production and freight turnover. In spite of the planned 7.6 per cent increase in the average annual output of industry and agriculture (compared with a 6.6 per cent increase in the preceding five-year period), the average annual growth of freight turnover will fall from 8 to 6.5 per cent.

The new Five-Year Plan envisages a further powerful upsurge of the economy of all the Union Republics. Firmly embodied in the Plan is the Leninist national policy aimed at the utmost consolidation of the friendship and fraternity of the peoples of the USSR. The five-year plans of the Union Republics will take into account their special economic features and potentialities, giving due attention to the need to strengthen economic ties between them and properly to consider the interests of all the fraternal peoples of the USSR. This approach to economic development will improve the distribution of the productive forces and enhance the efficiency of social production in the current five-year period.

Higher economic efficiency of production is directly linked with carrying out the decisions of the March and September (1965) Plenary Meetings of the CC CPSU, aimed at improving the methods of planning and economic management. The transition to the new system of planning and economic stimulation in industry, enhancement of the role of material incentives in

agriculture, improvement of planned leadership in other branches of the national economy with due allowance for their specific features—all this provides favourable conditions for developing the initiative of the factory collectives, and considerably increases their interest in accelerating production growth rates and raising labour productivity, and in increasing the amount and rate of profit.

The results achieved in the first quarter of 1966 by the industrial and transport enterprises operating under the new system show graphically that this system helps to bring out and make practical use of internal production reserves. All the 43 enterprises working in the new conditions have overfulfilled the increased plans for sales and profits. Their volume of sales has risen 12 per cent above the corresponding period of last year and 25 million roubles' worth of goods have been sold over and above plan. The increased plan for profits has been topped by 8 per cent and 8 million roubles of extra profit has been earned. The result has been a substantial increase in the material incentive and production development funds, coupled with bigger contributions to the national budget.

The effect of the measures to enhance the economic stimulation of agriculture is already beginning to be felt. For the first time in many years the planned purchases of animal produce and of a number of farm crops have been substantially exceeded. In the course of 1966 and 1967 the new system of planning and economic stimulation will be gradually introduced in all the key branches of industry. Extensive work

is being done to extend the system of economic incentives in the collective farms, and to transfer the state farms to operation on a cost-accounting basis.

The implementation of the economic reform on a nation-wide scale will create favourable conditions for successfully fulfilling the Five-Year-Plan targets and help to reveal additional resources for raising still further the Soviet people's living standard.

ECONOMIC SCIENCE AND PRACTICAL PLANNING

The role of economic science in improving the system of planning and management has grown enormously of late. The efforts of our economists are now concentrated on elaborating the *theory and methodology of the optimum planning* of the national economy using economico-mathematical methods. They are engaged in a profound analysis and definition of scientifically substantiated *rates and proportions* in the development of the different branches of industry, and in drafting concrete proposals ensuring *higher efficiency* of social production and outlining the prospects of its growth. Serious attention is also devoted to research on the comprehensive development of economic areas, the promotion of interregional economic ties and the rational employment of manpower resources. Particular importance must be attached to the problem of evolving a harmonious system of scientifically substantiated norms and prin-

ciples of planning, to the organisation and management of industry, and to combining centralised planning with the economic independence of enterprises.

The new economic reform accentuates the need for continued profound theoretical elaboration of problems concerning commodity-money relations, the law of value and ways and means of applying more fully the mechanism of its operation in stimulating production, as well as the scientific principles of price-formation in the socialist economy. The close connection of economic science with practical national economic planning is an important condition for successful economic research.

Further improvement of the scientific level of planning also presupposes the drafting of a number of preliminary variants of an overall national economic plan and of its individual elements on the basis of the varying conditions of economic development, with subsequent selection of the optimum variant. The drafting of plans must be preceded by the compilation of *long-term economic prognostications* giving an objective assessment of potential resources and of the growth of social requirements. Such prognostications must take into account the latest achievements of science and technology, and the advanced experience of other countries. The economists are called upon to draw up recommendations on major economic development problems in good time so that they can be given due consideration in the process of drafting long-term plans.

The number of Soviet research organisations

working on problems of improving the system of national economic planning has grown substantially in recent years. Suffice it to say that the country now has nearly 50 economic research institutes, many economic laboratories, as well as other economic subdivisions in sectoral research and designing institutes operating under diverse Ministries and departments. The total number of economists working in research institutes and higher schools is 31,000, more than 8,000 of them with doctor's and master's degrees.

The USSR State Planning Committee is working out measures to improve the training of economists, devoting particular attention to the problem of raising the economists' qualifications with due account to the new tasks posed by the extensive introduction of mathematical methods and computer techniques in the national economy. It is planned to expand the system of economic educational establishments, to improve the quality of instruction, and to step up the training of versatile economists capable of organising production effectively. Between 1966 and 1970 some 840,000 economists with higher and secondary specialised education will be trained for the national economy.

The reorganisation of planning as adapted to the new system of economic management will permit us to devote more attention to the drafting of plans and to the study of general economic problems. The efforts of the USSR State Planning Committee are now concentrated on improving national economic and sectoral proportions in social production, on extending

inter-sectoral co-operation and specialisation of production, and on distributing the productive forces more rationally.

Another important problem is to improve the methods of drafting current and long-term plans. Until recently long-term planning was reduced in the main to the fixing of control figures which, moreover, were not always handed down to enterprises. From now on the five-year plan with targets fixed for every year must become the principal form of planning. In the recent past the plans suffered from serious defects owing to lack of co-ordination between the volume of production, capital construction and material and technical supplies. The USSR State Planning Committee is taking measures to remove these shortcomings. It has set up a number of additional subdivisions whose activity is directed towards ensuring closer co-ordination of production plans with more rational distribution and use of national economic resources.

The Directives for the Five-Year Plan open up new prospects for enhancing the might of the Soviet state and for a further advance in the people's well-being. The economic policy of the Communist Party and Soviet Gorvernment accords with the people's fundamental interests. Consistent and effective implementation of this policy through the efficient carrying out of national economic plans is the main task of our planning organisations.

Economic Growth Rates

I. MALYSHEV, *Deputy Chief, USSR Board of Statistics*

Major economic problems which predetermine the further development and improvement of all aspects of life in socialist society will be solved in the next five years. Their solution will greatly influence the world situation and the international position of the Soviet Union.

Growth rates are one of the key problems. What does it mean to raise growth rates? It means to make fuller use of the advantages of the socialist mode of production, to operate the economy more efficiently. It is growth rates that express the increase in labour productivity and national income. From this follows the possibility of raising the people's living standard, the main economic task of socialist production. There is also a reverse dependence. Greater material incentives to the workers promote a rise in labour productivity and, consequently, raise growth rates.

Expansion of material production at a fast pace by enhancing economic efficiency affects all aspects of social life and accelerates the flowering of all the material and spiritual forces of socialist society. That is why Soviet economic growth rates attract the close attention both of our friends and of the foes of socialism.

SURMISES AND REALITY

Ten years ago a theory claiming that as the scale of Soviet industry expands, its growth

rates inevitably will slow down and draw nearer those of the old industrially developed capitalist countries, gained wide currency among Western economists. Many scientists, statisticians and people in quite different vocations are closely studying the growth rates of the Soviet economy and indulging in all kinds of forecasts on this score.

But as is often the case, a real study is replaced by "researches" which are far removed from science. These include distortion of the figures published in the USSR, the fabrication of figures and the voicing of all kinds of groundless surmises. In America, economists connected with the Central Intelligence Agency in general deny the importance of growth rates. The USSR, they assert, may outstrip the United States in growth rates while at the same time increasingly falling behind in the actual scale of production.

A well-known American economist, discussing such primitive statistical antics, remarked that, of course, the CIA was an establishment that had been able to overthrow the lawful government in Guatemala and in some other countries, but it was unable to abolish the law of compound interest. By virtue of this law, superiority in growth rates if it is continuous, inevitably turns into absolute superiority. This is exactly what has happened in the production of iron ore, coke, cement, diesel locomotives, electric locomotives, combine harvesters, window glass, woollen fabrics, and butter. The USSR has outstripped the United States in the production of all these goods.

The continuous swift economic growth of the USSR is a generally recognised fact. It is a law of socialist production. True, in recent years the growth rates have fallen somewhat. In the last five years, for example, industrial output increased 8.6 per cent annually on the average, while in the preceding five years the annual growth was 10.4 per cent. The national income, which epitomises the development of all sectors of production, increased on the average 8.2 per cent annually between 1956 and 1960 and 6 per cent between 1961 and 1965.

This decline has brought forth a new spate of surmises in the bourgeois press. For example, the *Christian Science Monitor* in its issue of July 13, 1965 recalled the fears caused several years earlier in the United States by Soviet achievements, the anxiety over the reports that the Soviet rate of economic growth was two or three times higher than American. Now the *Christian Science Monitor* told Americans to stop worrying since there were indications that Soviet growth rates were slowing down considerably.

In reality even the lower growth rates of the Soviet economy in recent years, especially in view of their continuity, are well beyond the reach of the capitalist countries.

At the same time the Soviet economy will again increase its growth rates.

AGRICULTURE AND THE ECONOMY

The main impulse to an upswing in the growth rates of the entire economy will be

provided by the accelerated development of agriculture. Its output should annually increase by 4.6 per cent instead of 2.1 per cent as in the last five years.

Are such rates possible? Yes. It will be recalled that weather conditions in 1965 were extremely unfavourable and the grain harvest declined considerably. But the stable system of purchases, the increase in purchase prices, and the cut in the prices of industrial means of production and other stimulating measures adopted by the Plenary Meeting of the CPSU Central Committee in March 1965 exerted their favourable influence on agriculture. Overall agricultural output even increased last year. The new economic conditions in the collective and state farms will undoubtedly have a powerful effect and will promote faster growth rates.

As a result of increased agricultural production the entire Soviet economy will develop at a faster pace. The gross product and the national income will rise 7 per cent annually on the average from 1966 to 1970 as against 6 per cent in the preceding five years.

The influence of agriculture on the economy is not confined to an increase in its own output. After a good season in agriculture the development of industry is considerably accelerated. The link between the growth rates of industry and agriculture is not accidental. Such large sectors as the food and light industries which produce the bulk of consumer goods can develop intensively only if there are adequate stocks of agricultural raw materials.

In general, three-quarters of the commodit-

ies in the consumption fund are produced from agricultural raw materials. This means that fast development rates in agriculture permit increased consumption and also accelerate the rise in labour productivity in all sectors of material production.

Approximately two-thirds of the accretion of the national income is contributed by higher labour productivity. But the growth of productivity is due not only to the progress of technology, but also to the personal interest of the worker. The principle of personal material incentive is a guarantee of the successful management of the socialist economy. The rise in labour productivity should be constantly stimulated by growth in the income of the workers and their level of consumption.

In elaborating the Directives of the Eighth Five-Year Plan particular attention was paid to raising the living standards of the Soviet people. All of the factors that determine the living conditions of the people—wages of factory and office workers, incomes of collective farmers, from collective economy, housing construction, the volume of trade and services, pensions, education and health services, will rise in the present five-year period faster than in the preceding five years. This can be summed up in two figures: real per capita incomes will rise 30 per cent instead of 20 per cent in the previous five-year period.

The Five-Year Plan, whose basic principles were formulated before the launching of the economic reform, aims to establish a better proportion between consumption and accumulation. In

the last five years the accumulation fund increased by 42 per cent and the consumption fund by 30 per cent, of which 8.5 per cent occurred only in the year of 1965. In the new five-year period the accumulation fund is to increase by 46 per cent and the consumption fund by 36-39 per cent. This means that their growth rates are drawing closer together. It should be stressed that the assignments for raising the people's well-being are not the limit. They will most likely be exceeded and then the growth rate of the consumption fund will draw even closer to that of the accumulation fund.

But to cope successfully with this task it is necessary to apply the economic measures which were elaborated by the Plenary Meetings of the CPSU Central Committee in March and September, 1965, and approved by the 23rd Party Congress. They contain tremendous potentialities for accelerating growth rates. This is confirmed by the initial results of industrial enterprises transferred to the new system.

GREATER EFFICIENCY OF CAPITAL INVESTMENTS

The Soviet state is applying the line of optimally combining accumulation and consumption and providing steady incentives for the workers as major conditions for accelerating the growth rates of socialist production.

One more potentiality is available for accelerating the rates of extended reproduction. These rates depend on the size of accumulation. Under the new Five-Year Plan, an average sum of

45,000 million roubles will be invested each year in industry, transport, communications and agriculture. This is approximately one-fifth of the entire average national income. In addition, large sums are invested in the building of houses, public utilities and service establishments. A further increase in the accumulation fund is impossible without detriment to consumption. Consequently, greater efficiency on the scale of the entire economy implies a maximum increase in the national income per invested rouble, and, at the level of the enterprise, in profit per rouble invested. We do not speak here of gross output because its increase is not always tantamount to a rise in economic efficiency.

The growth rates of the national income have declined owing to the inadequate efficiency of new investment. Under the new five-year plan, the main task in construction is to see that each enterprise which gets money from the state must spend it so as to enhance the efficiency of social production. This will increase the country's economic growth rates and hasten the rise in the people's standard of living.

Faster Pace for Consumer Goods Industries

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The present level of the productive forces in the Soviet Union makes it possible to expand

production on a large scale. Despite some shortcomings in the development of the Soviet economy between 1959 and 1965 the results of the Seven-Year Plan show that the Soviet Union almost doubled its economic potential. This was the basis for a considerable advance in the material and cultural standards of the people and for strengthening the country's defences.

The contemplated growth rates in 1966-70 are economically justified. The average annual increase of the national income during this period will be 7 per cent; of the gross industrial output, 8-8.4 per cent; of the gross output of agriculture, more than 5 per cent; capital investments, over 8 per cent and per capita of real incomes, 5.5 per cent. These relatively high targets will be achieved by rapid expansion of production, improvement of major national economic proportions and raising the efficiency of production.

GROWTH OF THE CONSUMPTION FUND

The new Five-Year Plan calls for faster growth rates in industries producing consumer goods, bringing them closer to the growth rates in industries producing capital goods. This will be achieved by furnishing stable raw material supplies for the development of the light and food industries and also by further expanding the production of consumer goods in heavy industry. As a result, growth rates in Group A and Group B will draw considerably closer. While in the preceding five years the output of

the means of production increased 58 per cent and of consumer goods 36 per cent, in the next five years the increase will be 49-52 per cent and 43-46 per cent respectively.

The main requirement for the further development of all sectors of industry is the utmost application of scientific and technological achievements. Rational structural shifts within industry are another important factor which will help improve the proportions between its separate sectors. While output of Group A will rise 50 per cent, the production of engineering and metal working will rise 60-70 per cent, chemical industry 100 per cent, electric power 70 per cent, and instruments and automation devices 70 per cent.

The Five-Year Plan provides for improved proportions between industrial and agricultural production. The main task in agriculture is substantially to expand the output of farming and animal husbandry so as to satisfy fully the growing needs of the population for food stuffs and industry's needs for raw materials. The average annual agricultural output in five years is to rise 25 per cent as compared with the preceding five years.

High and stable growth rates in agriculture will be ensured above all by a substantial consolidation of its material and technical basis. In accordance with the decisions taken by the CPSU Central Committee at its Plenary Meeting in March 1965, about one-third of the productive capital investments are to go to state farms and collective farms in the next five years; the delivery of mineral fertilisers is to be doubled

and more than half of the machines is to be renewed. Moreover, the share of state funds used by the collective farms to build up their material and technical facilities will rise, as a result of a great increase in long-term farm credit. The proportions between the output of means of production and consumer goods will be improved. A certain decline in the growth rates of output in Group A and in the volume of freight turnover will result from the improved location of the country's productive forces, and from the better structure and utilisation of the means of production. Industries producing means of production as planned will satisfy the needs of the economy in raw materials, fuel, metal, power, machinery and equipment.

The ratio between accumulation and consumption in the national income is a primary proportion which predetermines the growth rates of social production and the possibility of raising the people's living standard. For a long time the share of the consumption fund in the national income of the USSR (in actual prices) amounted to 72-75 per cent and the share of the accumulation fund, to 28-25 per cent. No essential changes in the allocation of the national income will occur in the next five years. The determination to attain the growth rates of industrial production and to extend the material and technical facilities of agriculture, as envisaged for 1966-70, ensure the maintenance of the high share of accumulation in the national income.

TECHNOLOGICAL PROGRESS AND IMPROVEMENT OF THE PEOPLE'S WELL-BEING

Capital investments in the economy, including the savings of the collective farms and co-operative and individual housing construction, will total 310,000 million roubles as compared with 211,300 million roubles in the preceding five years, that is, an increase of 47 per cent. The average annual growth rate of capital investments in the economy as a whole will exceed 8 per cent as against 6.1 per cent in 1961-65.

The fastest growth of capital investments is envisaged in agriculture, the chemical, light and food industries and the automobile, tractor and farm machinery industries. In particular, about 15,000 million roubles is assigned in 1966-70 for building enterprises of the light, food, chemical and other industries producing goods for the population, almost twice as much as was spent in the preceding five-year period.

Such an allocation of investments will help improve the structure of production, accelerate technological progress and raise the living standard. But the proportion which existed in 1956-65 when the growth rates of capital investment somewhat outstripped the growth rates of the national income will still be preserved in the planned period.

The task in the new Five-Year Plan is to achieve a substantial rise in the living standard. To accomplish it, the growth rates in agriculture and group B industries and, consequently,

in the magnitude of the consumption fund, will be raised. From 1966 to 1970, the consumption fund will increase by 36-39 per cent as compared with 31 per cent in 1961-65. On the average it will rise annually by approximately 11,000 million roubles, as compared with 6,500 million roubles in the preceding five years. All this will ensure a growth of per capita real incomes by about 30 per cent, as compared with 20 per cent in the preceding five years.

The needs of the population will be satisfied not only from the consumption fund but also from the part of the accumulation fund used for the building of houses, schools, hospitals and other service establishments in the non-productive sphere. The part of the national income utilised for expanding the fixed non-productive assets will, as hitherto, increase from year to year. Housing construction will attain a fast pace. A total of about 400 million square metres of floorspace will be made available for occupancy through state capital investments and co-operative building in five years.

The facilities of establishments serving the population have lagged considerably behind the growing needs in recent years. A shortage of children's pre-school institutions, schools, cultural centres, hospitals, public utilities and service establishments created difficulties in the development of new areas, and was one of the causes of big fluctuations of manpower. The existing practice of allocating investments for building houses and cultural and service establishments without observing the necessary proportions between them has resulted in a short-

age of schools, children's institutions, cinemas and cultural centres in new large residential districts. In the new five-year period about four-fifths of the national income will go for satisfying the needs of the people, taking into account the consumption fund and non-productive accumulation. The extensive scale of economic and cultural development in 1966-70 will create the conditions for an increase in the employment of the able-bodied population. The number of factory and office workers engaged in the economy will rise 18-20 per cent in 1970 as compared with 1965. Thus, not only will the entire increase in the able-bodied population be employed in state enterprises or engaged in study, but a considerable number of the able-bodied population will be drawn into social labour from household and personal subsidiary economy. The rises in labour productivity and in the national income permit a considerable increase in the number of persons engaged in the services and also in science, education and other non-productive sectors. The share of workers in the non-productive sphere in the total labour force will rise somewhat and will reach about 22 per cent as against 20 per cent in 1965.

The big programme of capital construction will expand the fixed productive assets in the economy by more than 50 per cent, including 60 per cent in industry and about 90 per cent in agriculture. Calculations show that the renewal of fixed productive assets in the entire economy and in industry will reach approximately 50 per cent of the total during this period and more than 60 per cent in agriculture.

HIGHER EFFICIENCY OF PRODUCTION

But the main thing is not the quantitative expansion of the country's productive machine. In the current five-year period the use of existing capacity and the build-up of new capacity will be accompanied by a rise in the industrial level and higher efficiency of all social production. Industrialisation has always been the main trend in the development of the socialist economy. Before the war, as a result of industrialisation the Soviet Union built a powerful heavy industry and, on this basis, all sectors of the economy were technically reconstructed. But since then serious changes have occurred in the development of science and technology. New industries and categories of production have arisen. Improved machinery and equipment, materials and manufacturing processes have been developed.

One of the main tasks of the new Five-Year Plan is to industrialise all social production by applying the latest scientific and technological achievements. The main trends of technological progress at the present stage are electrification, chemicalisation, comprehensive mechanisation and automation. In line with this, the national economic plan for 1966-70 provides for the priority development of the electric power, chemical and engineering industries and also the considerable expansion of electronics, radioelectronics, the manufacture of electronic computers, synthetic materials and other modern industries which accelerate technological progress in all sectors of the economy. The share of the elect-

ric power, engineering and chemical industries in total industrial output will rise from 35 per cent in 1965 to 40 per cent in 1970.

To ensure faster growth of the electric power industry new plant of 64-66 million kw capacity will be commissioned, which approximately equals the capacity of all electric stations built prior to 1960. In the main, large thermal power plants with a capacity of up to 3 million kw will be built; they will have power units of 300,000, 500,000 and 800,000 kw. Establishment of a single power system in the European part of the USSR is to be completed and the necessary preparatory work done to transmit large quantities of electric power from the eastern to the central areas. Total generation of electric power will rise 70 per cent and amount to 840,000-850,000 million kwh. Consumption of electricity in all sectors of industry and the economy will rise substantially. Consumption of electric power for the production needs of agriculture will increase 190 per cent, industry 70 per cent, public utilities and household needs of the urban population 60 per cent and the rural population more than 200 per cent.

The industrial development of the transport system and communications will be aimed at creating a single transport network and a single automated communication system, taking into account the economic development of new areas. Transfer of the railways to electric and diesel traction will be completed in the main. As a result of further industrialisation, construction will turn into a comprehensively mechanised process of assembling buildings and struc-

tures from standard prefabricated elements.

In 1970, as a result of the faster development of the chemical industry 50 per cent more chemical products will be consumed per rouble of gross industrial output and 100 per cent more per rouble of agricultural produce than in 1965. Production of consumer goods and household articles made of chemicals will increase from 150 to 200 per cent. Progress in engineering during the five-year period will be chiefly along the lines of enlarging the capacity and speed of machinery and equipment, while reducing unit weight and lengthening the service life. Priority development of the electric power, chemical and engineering industries will ensure a substantial rise in the efficiency of all social production.

Industrial development of social production is aimed at raising its efficiency. This is expressed in the growth of labour productivity, saving of material outlays and improvement in the use of productive assets and capital investments and higher profitability of production.

As a result of the expansion and improvement of the production machine in all sectors, power consumption per worker will increase by more than 50 per cent in industry and approximately by 200 per cent in agriculture. Growth rates of labour productivity will be higher under the new Five-Year Plan than during the preceding one. The average annual rates of increase in labour productivity per employed person are to be as follows: 6 per cent in industry (4.6 per cent in 1961-65) and 7.2 per cent in agriculture (3.7 per cent in 1961-65). The main part of the accretion in labour productivity in all sectors

is to be obtained by expanding the technical facilities used by each worker, mechanising and automating production, improving manufacturing processes and introducing scientific labour organisation, improving the quality of goods and rational location of new factories.

Productivity of social labour in the economy (measured by the volume of the national income per person engaged in material production) will rise about 30 per cent between 1966 and 1970. Calculations show that 80 per cent of the planned increment of the national income will be contributed by higher labour productivity and 20 per cent by the greater number of workers in material production.

The saving of material outlays is an important factor in raising the efficiency of social production. A reduction of these outlays in industry by only 1 per cent adds more than 1,500 million roubles to the national income. There are tremendous potentialities for saving material resources in all sectors of the economy. It is a fact that in the engineering industry metal wastes reach up to 40 per cent; losses of dry materials (cement, mineral fertilisers, etc.) during transportation and storage reach 20 per cent; waste of timber sawing and processing, not utilised in manufacture, totals about 70 million cu. m, or 25 per cent of total timber felled.

The Five-Year Plan provides for a big improvement in the use of raw materials and other supplies, fuel and electric power. For example, the task is set to reduce the consumption of rolled steel in engineering and metal-working

by about 20-25 per cent; fuel consumption rates for industry as a whole are to be cut by 8-10 per cent, in the iron and steel industry by 17 per cent and in the non-ferrous metal industry by 8 per cent. The consumption of fuel per kw of electric power is to be lowered by 11-14 per cent. Consumption rates of electric power for industry as a whole will be reduced by 6-8 per cent. In the light industry the consumption of yarn per square metre of woollen fabrics is to be cut by 13 per cent and of cotton fabrics by 4 per cent.

Reduction of material outlays will be achieved by introducing new economical machinery and equipment and more improved manufacturing processes. For example, one-fourth of the expected reduction of metal consumption in engineering will come as a result of a considerable increase in the production of economical shapes of rolled stock. The total output of rolled steel will increase by 40 per cent, while the output of cold-rolled sheet steel will rise by more than 100 per cent and cold-drawn sectional steel, by 120 per cent. The total saving of material outlays in industry by using more economical consumption rates will amount to about 9,000 million roubles in 1970 as compared with 1965. As a result of the rise in labour productivity and the cut in the unit consumption of materials, profit in the economy will approximately double in five years.

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Huge potentialities for enhancing the efficiency of social production are inherent in the

improved use of productive assets and capital investments. Thus, an increase in the return on fixed assets of only 1 per cent is tantamount to an industrial output worth 3,000 million roubles. But at present, according to data of the USSR Central Statistical Board, productive capacity in almost all industries is utilised to the extent of 70-80 per cent. Frequently, the building of new enterprises takes twice or three times longer than scheduled. The actual cost of construction in a number of cases is 50 to 100 per cent above the estimates. Assignments for the commissioning of productive capacity are not always fulfilled. As a result of the incomplete commissioning of new plant, flaws in design and other causes the periods for bringing production up to the designed capacity at many enterprises are much longer than planned.

In the new five-year period it is necessary radically to improve the use of productive assets and capital investments. For most sectors it is planned to bring up the utilisation of plants in operation on January 1, 1965, to 96-100 per cent of rated capacity. This will make it possible to raise their output-asset ratio by 12-15 per cent.

Growth rates, improvement of the basic national economic proportions and of the indicators of the efficiency of social production are interconnected and reciprocally determined. The indicators of social productive efficiency envisaged in the Five-Year Plan, ensure an acceleration of the country's economic growth and a substantial rise in the living standard of the people.

Improvement of the Industrial Sectoral Structure

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The structure of industrial production is becoming an important general determinant of the development level of the productive forces in the USSR in the present conditions of fast technological progress and steady deepening of the social division of labour. This structure, reflecting the allocation of social labour between separate sectors, enables us to judge the degree of development of industries which determine technological progress and a rise in the efficiency of social production.

INTER-SECTORAL PRODUCTION TIES

Structural shifts in industry are quantitatively expressed as changes in the shares of various sectors. The change in the sectoral structure may also be defined by a correlation of the growth rates of sectors throughout industry.

Purposeful, planned improvement of the structure of production by the faster development of progressive sectors decisively affects the establishment of rational proportions in the economy and raises the efficiency of social production. Attainment of a progressive sectoral

structure of industry is a prolonged, intricate and multifarious process. The proportions between sectors at each specific moment are determined by the cumulative action of many factors. That is why a change in the correlation between sectors is possible only as a result of furnishing definite economic, technical and organisational prerequisites. Neglect of this condition, the stepped-up growth of one or several sectors without corresponding development of allied sectors and categories of production inevitably causes substantial losses in the national economy and a waste of social labour. There have been such instances in economic activity and they were condemned by the Central Committee of the CPSU at the October 1964 and subsequent Plenary Meetings.

Mistakes of an opposite nature are likewise intolerable. These are a mechanical carrying over of existing proportions and development trends into the future, without taking into consideration the new and progressive elements which have appeared in production and the achievements of world science and technology.

Scientific planning of the sectoral structure of industry requires profound study of the basic factors which determine a change in inter-sectoral proportions, and the introduction of new methods in planning. One of them is the inter-sectoral balance (input-output tables) method, which makes it possible to take into account all the complex and diverse factors which determine proportions in the development of the various sectors.

A decisive place among these factors is held by the *main economic-political task* which in the given historical conditions is determined by considering the demands of objective economic laws, an analysis of the production level and the possibilities of its further development. This task determines economic policy as regards the relationship of accumulation and consumption. Division of the national income between accumulation and consumption is the fundamental problem of each long-term plan. Upon its solution depend such major indicators of the structure of industrial production as the share of production of means of production (Group A) and production of consumer goods (Group B); the correlation between branches of the engineering industry which manufacture instruments of labour and branches which produce objects of labour, etc. The greater the share of accumulation, all other conditions being equal, the more Group A should outstrip Group B in growth rates, and vice versa. At a high rate of accumulation it is essential that the expansion of the engineering industry should substantially run ahead of the development of industry as a whole.

Development of *inter-sectoral production ties* is a major factor in changing the sectoral structure of industry. It is expressed in the distribution of the material inputs to a sector. Under the influence of technological progress and the improvement of machinery, manufacturing processes, production organisation, intersectoral ties are constantly changing. Sectors producing the most economical raw materials

and other supplies, semi-manufactures and fuel increase their deliveries to consuming sectors and thereby relatively (and at times also absolutely) reduce the need of the economy for the less efficient goods. For example, the accelerated development of the oil and gas industries relatively (per rouble of output) reduces the need for coal. An increase in the production of cheap chemical fibres reduces the consumption of natural fibre per rouble of output of light industry. In the new Five-Year Plan further electrification, chemicalisation, mechanisation and automation, improvement in the pattern of the raw material and fuel balances and the utmost development of specialisation, co-operation and integration in industry will serve as the basis for changes in inter-sectoral production ties.

Changes in the *pattern of popular demand* are an essential factor requiring the closest attention in ascertaining inter-sectoral proportions for the planned period. As the people's standard of living rises, this factor acquires ever greater significance.

While recognising the determining role of production, it is necessary constantly to consider the reverse influence of consumption on its level and structure. Thus, the constant rise in the demand for household appliances and articles of cultural use, for consumer goods manufactured by the chemical industry and for knitted goods is influencing the structure not only of industries producing consumer goods but also of allied sectors which manufacture means of production.

The cumulative action of these factors shapes definite tendencies in changing the sectoral pattern of industry.

ELECTRIFICATION, MECHANISATION AND CHEMICALISATION OF INDUSTRY

A constant rise in the share of *the electric power industry* is an important trend governing changes in the sectoral structure of industrial production. Between 1961 and 1965, the share of the power industry in total industrial output increased by one-fourth. The faster development of this industry is also envisaged in the new Five-Year Plan. The need for a more rapid increase in the production of electric power and heat is dictated by the task of steadily extending the electrification of production and everyday life. The consumption of electricity is swiftly rising in the metallurgical, chemical, timber, woodworking and light industries. An analysis of inter-sectoral ties shows that in 1970 consumption of electric power per rouble of industrial output will rise approximately 30 per cent as compared with 1965, and by more than 100 per cent per rouble of agricultural output.

Establishment of the proper correlation of growth rates in *engineering* and in all industry is an urgent problem in planning the sectoral structure. To achieve high growth rates of social production and constantly to raise the technical level of all sectors of the economy, to mechanise and automate manufacturing processes, engineering has to develop faster than all other in-

dustry. The excess growth rate depends largely on the share of productive accumulation in the national economy, the share of equipment in capital investments and the development of specialisation and co-operation in engineering. Between 1951 and 1960, the share of engineering and metalworking in the gross output of all industry rose by two-fifths in the USSR and one-tenth in the United States. In the last five years it increased by another one-fifth in the USSR, while remaining approximately at the old level in the United States, Britain and France. The share of engineering and metalworking in the gross output of Soviet industry changed as follows: 1950, 15 per cent; 1955, 18 per cent; 1965, 26 per cent; 1970 (estimate), 28-29 per cent.

Such an increase in the share of engineering is determined above all by the high growth rate of production and accumulation and the steady rise in the technical equipment of all sectors of the economy. At the same time it, to a certain extent, also attests to lower efficiency of Soviet machinery as compared with foreign. A system of measures for radically improving the technical and economic parameters of Soviet-made machinery and equipment, their quality, reliability and service life is to be carried out in the next five years. The output of the Soviet engineering industry must be on a par with that of the best examples of foreign technology.

In view of the contemplated measures for raising the efficiency of machinery and equipment, a certain drawing together of the growth rates of engineering and overall industry is en-

visaged. The share of engineering in gross industrial output is to rise approximately by one-tenth in 1970 as compared with 1965. Moreover, it is intended to maintain the much faster development of the more progressive sectors of engineering (electrical equipment, precision instruments, radio electronics, machinery for the chemical and oil industries, etc.) as compared with industry as a whole. Accomplishment of the tasks set by the Plenary Meeting of the CPSU Central Committee in March 1965, of supplying agriculture with machinery and equipment for completing its comprehensive mechanisation, makes it necessary substantially to raise the share of the tractor and farm machinery industry in total industrial production. In the new Five-Year Plan special attention will be paid to the accelerated growth of sectors of the engineering industry which produce goods for the population—refrigerators, washing machines, TV sets, motor cars, and other machinery and appliances which improve the life of the people.

A continuous rise in the share of the *chemical industry* in total industrial output is a characteristic feature of the evolution of the industrial pattern in any industrially developed country. In the last 15 years, its share in gross output of all industry has risen as follows: Soviet Union, by seven-tenths; United States, Britain and France, by about half; West Germany, seven-tenths and Italy, more than double.

Though the Soviet chemical industry is swiftly outstripping the overall growth rate of all industry, the Soviet economy so far lags be-

hind the most developed capitalist countries in the level of chemicalisation of production.

In view of the high efficiency of chemicalisation of production, the new Five-Year Plan provides for accelerated growth rates in the chemical industry. While the share of the chemical industry in the total industrial output of the USSR rose from 4.3 to 5.6 per cent between 1960 and 1965, that is by three-tenths, in the new Five-Year Plan it will reach 7.6 per cent. Fulfilment of the assignments for the development of the chemical industry will ensure a substantial rise in the consumption of chemicals in all sectors of the economy. Consumption of chemicals between 1965 and 1970 will increase approximately 30 per cent per rouble of industrial output and more than 100 per cent per rouble of agricultural output.

Consumption of chemical products in the wood processing, light and building materials industries will register the biggest gains. This is due to the rapid introduction of chemical and chemico-mechanical methods of processing timber, to the constant expansion of the use of chemical fibres and leather and fur substitutes in light industry, to the development of the production of non-woven fabrics and also to the replacement of food products used for industrial purposes by chemical preparations and the swift expansion of the production of building materials and components from plastics, linoleum, glass fibre plastics, etc. The consumption of chemicals by the chemical industry itself is rising substantially, which is connected above all with the change in its intra-sectoral pattern,

(that is, the increase in the share of plastics, synthetic resins, artificial and especially synthetic fibres, etc.). The share of consumer goods in the chemical industry will rise substantially. With a general increase of 100 per cent in the output of the chemical industry production of consumer goods should rise 150-200 per cent.

The correlation of growth rates in the metallurgical industry and in all industry largely depends on the rate of development in the main metal-consuming sector — engineering and metalworking. A primary part is played by the growth rates of engineering and metal working and the change in the consumption of metal per rouble of output.

Despite the high growth rates of engineering which greatly exceed those of industry overall, the share of the iron and steel industry in total industrial output declined in the last 15 years by one-fifth. This in the main is explained by a cut of the unit metal consumption in engineering.

In the new Five-Year Plan the growth rates of the iron and steel industry and of industry overall will draw closer together which will make it possible to satisfy the needs of the economy in iron and steel. The production of high quality metal—cold-rolled sheet steel, cold-drawn sectional steel, steel wire and pipes of different sizes will be especially expanded. The faster development of engineering and the more efficient use of non-ferrous metals promote the accelerated growth of the non-ferrous metals industry and the constant rise of its share in gross industrial output. This tendency will be pre-

served during the present five-year period.

The new Five-Year Plan requires the accelerated development of *the fuel industry*. As a result the relation between the growth rates of this sector and of all industry will change substantially. Between 1950 and 1965, gross output of the fuel industry increased by 230 per cent, while total industrial production rose by 360 per cent. The share of the fuel industry in gross output declined by almost one-third during these years. This was determined chiefly by a cut in fuel consumption per unit of output. This reduction was particularly marked in the electric power industry in view of the concentration of capacity and on the railways as a result of their transfer to electric and diesel traction. At the same time the considerable lag in the production of fuel behind the general growth of industry caused strain in providing the economy with fuel, aggravated in recent years by the bigger needs for oil and gas as raw materials of the chemical industry.

In the next five years the share of the fuel industry in total industrial output is to be practically stabilised. This sector will develop approximately at the same pace as industry as a whole, which will make it possible to provide the economy more adequately with fuel and with oil and gas as raw materials.

Considerable structural changes will also occur within this sector. High efficiency in the use of oil and gas fuel, and the growing needs of the chemical industry determine the need for expanding the production and processing of oil and gas at higher rates than other sectors of

the fuel industry. In five years production of natural gas is to increase by more than 70 per cent, oil nearly by 50 per cent, and coal by less than 20 per cent. As a result, the share of oil and gas in the country's fuel balance will rise from 52 per cent in 1965, to 60 per cent in 1970.

TIMBER, PAPER AND BUILDING MATERIALS

Growth rates of the timber, paper and woodworking industries will be greatly stepped up in 1966-70. While in the preceding five years total output in this sector rose approximately 30 per cent, in the new Five-Year Plan it will increase by more than 50 per cent. As a result, the share of this sector in gross industrial output will no longer decline and will even rise somewhat. The accelerated expansion of the timber, paper and woodworking industries is necessitated by the big expansion in processing timber and the wider use of chemical and chemico-mechanical methods of threatment. While the scale of timber felling is to rise little in five years, the production of cellulose is to grow by 160-180 per cent, paper by 50-70 per cent, and cardboard by 190-210 per cent. This will make it possible to satisfy more adequately the people's needs for these materials.

The relation of the growth rates in the *production of building materials* and in the total industrial output depends on an increase in the volume of building and assembly work which, in its turn, is directly determined by the growth rate of capital investments. Moreover, this rela-

tionship is essentially affected by a change in the consumption of building materials per rouble of building and assembly work. Between 1950 and 1960, when the increase in capital investments considerably outstripped the expansion of industrial output, the share of the building materials industry in total industrial production increased by four-fifths. In subsequent years the growth rates of capital investments began to lag somewhat behind those of the industrial output. In view of this, the share of building materials in total industrial output has been stabilised.

In the new Five-Year Plan, as before, industrial production is to grow faster than capital investment. In this connection the growth rate in the production of building materials is set at the level of all industry, and its share in total industrial production will remain unchanged.

The structure of the building materials industry will be essentially altered. A faster pace will be set in the production of prefabricated reinforced concrete, building panels and parts from plastics, asbestos and cement articles and heat insulating materials, soft roofing and other modern building materials. This will constitute an important prerequisite for raising the efficiency of construction.

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The relation between growth rates of the *light and food industries* and overall industrial output has one essential feature. Since the output of the light and food industries consists in the main of consumer goods, the law of priority

growth of means of production determines their development at lower rates than industry as a whole and, consequently, a decline of their share in gross industrial output. From 1950 to 1960 the share of the light industry in total industrial output declined approximately by one-fifth and of the food industry, by one-fourth. During this period the share of the light industry in the United States decreased by one-sixth and of the food industry by one-tenth.

In the last five years the growth rates of light industry were slowed down considerably, which substantially reduced its share in total industrial output. This situation was caused, on the one hand, by the low growth rates of agricultural production during these years which created serious difficulties in supplying light industry with raw materials. On the other hand, workers in this industry paid insufficient attention to improving the assortment and the quality of goods, and did not take into account the constantly rising requirements of the population in attractive and high-quality goods. As a result, large stocks of unsold goods accumulated in the trading network, creating serious obstacles to the further expansion of output. Measures taken to eliminate these shortcomings made it possible to step up growth rates of light industry in 1965.

In the next five years it is planned to double the growth rates of light industry as compared with the preceding five-year period, with a simultaneous improvement in the assortment and quality of the goods. Production of knitted goods enjoying a big demand will be expanded

at a particularly fast pace, greatly exceeding the growth rates of overall industrial output. This will mitigate the tendency to reduce the share of light industry in total output, which became particularly pronounced in the last five years.

Low growth rates of agriculture in the past five years also affected the development of the food industry. From 1951 to 1960, the growth rates of such important sectors of the food industry as meat-packing and dairy produce considerably exceeded the growth rate not only of the food industry but of all industrial production. But between 1961 and 1965 the output of the meat-packing industry rose insignificantly and the growth in output of the dairy industry increased less than that of the food industry as a whole. While between 1951 and 1960 the share of these sectors increased, in the last five years it noticeably declined.

In 1966-70, it is planned to ensure high development rates in the most important sectors of the food industry, improve the composition of goods and their quality. The contemplated growth rates will make it possible to reach in 1970 rational consumption standards for such prime foodstuffs as sugar, fish, vegetable oil, confectioneries, bakery products, macaroni, and high-grade flour.

* * *

In summing up we can note the following main trends in improving the sectoral structure of industry in the new Five-Year Plan:

bringing the growth rates in heavy industry closer to those in the light and food industries;

faster development of industries ensuring technological progress in the entire national economy, above all, the electric power, engineering and chemical industries;

progressive shifts in the structure of sectors forming the fuel balance of the national economy; further growth of the share of the oil and gas industry in the overall industrial output;

progressive changes in the structure of sectors which shape the raw material balance of the economy and ensure a higher share of synthetic materials, non-ferrous and high-quality ferrous metals and products of the chemico-mechanical processing of timber;

improvement of the structure of the light and food industries aimed at the fuller satisfaction of the requirements of the people in food, clothing and footwear.

The contemplated changes in the sectoral pattern of industry will be an important factor in raising the efficiency of social production in the new five-year period.

Territorial Planning in the New Conditions

S. TOKAREV

Territorial planning is determined by the social division of labour, and is a component part of economic management in the USSR. On the one hand, this system of management is dictated by the structure of social production and, on

the other, by the location of the productive forces and natural resources within the country, specialisation of production, the available labour force and its skills, and also by other conditions which make for the specialisation of areas and territorial-industrial complexes, and the division of labour between them.

The territorial division of labour, resulting from the formation of economic areas, closely linked by the exchange of products, offers big possibilities for improving the social productivity of labour. The development and specialisation of economic areas increase the territorial division of labour and strengthen their ties with the Union Republics. Consequently, it also stimulates higher productivity of social labour.

COMPREHENSIVE DEVELOPMENT OF THE PRODUCTIVE FORCES

A sector of the economy, particularly an industry, however well planned, cannot exist in isolation. Any enterprise, no matter under whose jurisdiction it works, has to solve a whole range of problems pertaining to the supply of power and building materials, transport facilities, manpower, availability of cultural and service establishments catering to its personnel, and production ties with other enterprises. That is why in formulating national economic plans it is necessary to ensure the reciprocally dovetailed, comprehensive development of the productive forces by economic areas and Union Republics.

It was noted at the Plenary Meeting of the CPSU Central Committee in September 1965 that the branch or sectoral principle of management must be combined with the territorial principle. That is, it is necessary to ensure the accomplishment of inter-sectoral tasks of the comprehensive development of the economy as a whole, and also of the separate republics and areas, while extending the economic rights of the Union Republics. This proposition appeared in the resolutions of the 23rd CPSU Congress which state that "the task of increasing the efficiency of social production requires a further improvement in the location of the productive forces, comprehensive development and specialisation of the Union Republics and of economic areas, fuller involvement of the able-bodied population in production, and proper co-ordination of planning for each territorial division with the sectoral principle of managing the country's economy."

In Soviet times the location of the productive forces has been greatly altered within the country. A socialist system of geographic distribution has been devised, and the all-round economic and cultural development of the Union Republics and economic areas has been ensured. But since planning was often of a one-sided nature and there was not sufficient reciprocal dovetailing of sectors by areas and all the conditions in the development of economic areas and the Union Republics were not taken into account, there are serious shortcomings in the location of some of the productive forces.

The most essential of them are the existing

discrepancy between the rich and highly economical natural resources in areas east of the Urals and the degree of their development and use, on the one hand, and the level of industry and the power and raw material facilities in the European part of the USSR and the Urals, on the other.

Violation of proper proportions in the territorial location of the economy leads to big losses. Thus, the concentration of power-intensive industries in the European part of the USSR and the Urals means that their further development here necessitates the large-scale delivery of fuel from eastern areas. About 300 million roubles are annually spent solely on the transportation of fuel to the European USSR and to the Urals. The cost of transporting a ton of strip-mined Kusnetsk coal to the European part of the USSR is 10 per cent higher than its production cost. The cost of gas delivered to the Urals from Central Asia is six times greater than at the point of extraction. Calculations show that in the European part of the USSR additional consumption of one million tons of standard fuel involves a growth in capital investments of 20-25 million roubles, and in operating costs of 5-7 million roubles, as compared with its consumption in eastern Siberia or Central Asia. On the average the cost of a ton of standard fuel in the European part of the USSR and the Urals, even if we assume maximum consumption of such economical types as natural gas and diesel oil, is 50 to 100 per cent higher than in Siberia and Central Asia owing to transportation expenses.

To establish expedient territorial proportions,

in particular between areas in the European part of the USSR and areas east of the Urals it is necessary to change the structure of the economy in the former, with the object of sharply limiting the development of fuel- and power-intensive industries. The European part of the USSR and the Urals will for many years retain a leading place in the country's economy as a whole. That is why to create the most efficient structure of the country's economy it is necessary systematically, from year to year, to increase the share of the eastern areas in power-intensive sectors, the production of electric power, coal and steel, timber and cellulose. In the new Five-Year Plan the specialisation of the eastern areas in fuel, electric power and power-intensive goods will increase.

Elaboration of plans for the comprehensive development of economic areas acquires particular importance for the East, where new districts with a high concentration of the needed natural resources will be developed. For example, it is planned to build a large national economic complex in the West Siberian lowland where big reserves of oil and gas have been discovered, and there are tremendous resources of timber and other natural wealth. It will become a large centre for the production of oil and gas, timber, cellulose and paper. In 1970, oil production in the West Siberian lowland is to reach 20-25 million tons. In that year the large deposits of gas in the Tyumen and Tomsk Regions are expected to yield 16,000-26,000 million cubic metres of gas.

CENTRALISATION OF GUIDANCE AND LOCAL INITIATIVE

As social production develops, each sector displays a tendency to independent differentiation. A similar tendency is inherent in sectoral planning which deals with similar production located throughout the entire country. In view of this, sectoral planning alone does not take into account the need to combine production in the given sector with other sectors in a single complex within the given economic area. Here is an objective factor which creates departmental and sectoral disunity. Yet, as Lenin pointed out in the first Soviet years, national economic planning must ensure the economical and rational use of the material and manpower resources not only by sectors of the economy but also over whole areas.

At the 9th Congress of the Communist Party (1920) the task was set to preserve and develop vertical centralism along the line of central administrations, and to combine it with horizontal subordination along the line of economic areas where different industries have to be fed by one and the same sources of local raw materials, transport facilities, manpower, etc. It is well to recall that the GOELRO plan (the plan for the electrification of Russia drawn up in 1920.—Ed.) was elaborated simultaneously along sectoral and territorial lines.

These fundamental propositions have lately been forgotten. Territorial planning was of a passive nature. Yet it must establish and ensure economic ties between diverse types of produc-

tion owing to their territorial contiguity.

The main task of territorial planning is to secure in national economic plans the rational combination of different sectors within economic areas and Union Republics, that is, the comprehensive development of areas and Republics, and thereby to raise the efficiency of social production.

The territorial aspect of the plan must be secured by wide and economically justified interaction and combination of sectors of industry and agriculture, construction, transport and the employment of manpower resources within the bounds of areas and Union Republics. In so doing every account should be taken of the natural, economic and historical conditions and also the national composition of the population—one of the key economic factors. The main thing here is not only to determine the general indicators of economic development but also rationally to ascertain the place and role of each Republic and area in accomplishing the general tasks of the state.

The Plenary Meeting of the CPSU Central Committee, held in September 1965, outlined measures for the harmonious combination of the sectoral and territorial management of industry. This was reflected in the establishment of Union-Republican ministries and economic associations in a number of industries and also the extension of the rights of the Union Republics in planning capital construction, financing, labour and wages. This will make it possible to combine the interests of the state and each Republic, combine centralised guidance

with stimulation of the initiative of the Union Republics, local agencies and enterprises.

In present-day conditions to raise the scientific level of planning by economic areas and Union Republics implies above all the concentration of effort on ensuring the fulfilment of the general state assignments by bringing to light and utilising the full resources and potentialities of each Republic and economic area.

The economic rights of Union Republics are being extended. Their functions now include the elaboration of plans for the comprehensive development of the economy on their territory. At the 23rd CPSU Congress A. N. Kosygin noted that "the plans of the Union Republics must proceed from the economic distinctions and possibilities of each Republic and provide for the consolidation and improvement of economic ties between Union Republics and take into account the interests of all the fraternal peoples."

The functions of the Gosplans in the Union Republics include the drawing up of draft plans for all industries subordinated to Union-Republican and Republican ministries, and also proposals on the draft plans of enterprises under the jurisdiction of all-Union ministries located on the territory of their Republic. They also have to examine questions of an inter-sectoral nature in industry within the Republic which arise in the course of plan fulfilment, and to draw up proposals on these matters. Republics will also be able to exert greater influence on expanding the production of goods needed for satisfying local requirements and manufactured at enterprises under the jurisdiction of all-

Union ministries. The main demand made during the elaboration of plans for the comprehensive development of economic areas and Republics is to achieve the most advantageous territorial proportions in the development of industry, agriculture, transport and other sectors, to ensure high economic growth rates and a rise in the productivity of social labour and to make better use of natural wealth and manpower.

Experience shows that central planning agencies frequently do not take sufficient account of the natural tendencies and local interests, and, conversely, local agencies, not considering the general trend of the national economic plan and not representing the country's economy as a whole, approach a solution of the various questions in a narrow parochial way. The level of planning can be raised only if the territorial and sectoral aspects of the plan reciprocally adjust each other. This is in line with Lenin's directives. Speaking about assistance to the central apparatus, Lenin demanded "the model organisation of a 'complex,' even if on a small scale; I say 'complex' meaning not just one farm, one branch of industry or one factory, but a *totality* of economic relations, a *totality* of economic exchange even if only in a small locality." Lenin repeatedly drew attention to the need for exact reciprocally co-ordinated planning, the elaboration of a single comprehensive economic plan stressing that "one of the greatest evils hindering our economic development is the absence of co-ordination in the work of the various local departments."

Reciprocally co-ordinated comprehensive

development of the productive forces by economic areas and Republics is one of the advantages of the socialist system, a powerful means of saving social labour, because it makes it possible to abolish the friction between enterprises and sectors in the localities and to utilise most rationally the natural resources, manpower and the available material wealth.

Efficiency in Management

Y. LIBERMAN, *Professor, Kharkov University*

The Directives of the 23rd CPSU Congress formulated one of the primary tasks on the accomplishment of which the success of the Eighth Five-Year Plan largely hinges. It is to ensure the proper combination of centralised planned guidance with local initiative, to increase the economic stimulation of production, to extend the economic independence of enterprises and to provide greater material incentives to workers. In brief, the question is the application of the new reform elaborated by the Plenary Meeting of the CPSU Central Committee held in September 1965, which prescribes economic methods of guiding the economy.

This reform is now being implemented. Early in 1966, 43 enterprises began to work in the new way and from the very first steps registered tangible achievements. Then, another 200 enterprises switched over to the new system and entire industries are preparing to introduce it.

The following article by Yevsei Liberman, well-known Soviet economist, discusses problems of the economic reform.

* * *

Decisions of the September Plenary Meeting, subsequently consolidated in the Directives of the 23rd CPSU Congress on the new Five-Year Plan, meet the urgent demands of life, the demands of objective economic laws. They follow from the fundamental tasks of building the material and technical base of communism. Naturally, the reorganisation programme also reflects the ideas voiced in the course of the extensive discussion of the problems of planned economic guidance. Simultaneously both polemical extremes and incongruities were turned down.

The reorganisation programme is a programme not only for the present day, it is intended to continue for a long period. The general objective is the further improvement of the system of planning and economic stimulation to achieve higher efficiency. The reform proclaimed by the Party cannot be implemented at once in its final form. The decisions of the September Plenary Meeting and the 23rd CPSU Congress make it possible to effect the transition to the new system in a better planned and smoother way than was suggested during the discussion. Speaking technically, the reorganisation programme makes it possible to "fuse" the new system into the existing national economic

mechanism during the Five-Year Plan without obstructing the Plan or the country's economic life.

It should be stressed that the Party decisions contain all the requisites for further advance to an even more efficient management system which combines centralised planning and economic independence of enterprises. I see four such major requisites: first, restrictions on the use of the wages fund by enterprises will eventually be no longer needed; second, the number of items which are planned in physical terms must be sharply cut; third, the strengthening of direct contract ties will make it possible fully to reorganise supply along the lines of wholesale trade. And, lastly, as the profitability of enterprises rises, they will be able to use ever bigger sums for their technical development and for material incentives to the workers.

In the first stage of reorganisation, the wages fund is limited. But when we saturate trade channels with sufficient quantities of high-quality consumer goods, thereby creating a commodity equivalent to high wages, there will be no need to limit the enterprise in its use of the wages fund. This will give the enterprise new opportunities for raising the productivity of living labour. Indeed, why should a factory keep a superfluous worker if it is able to provide greater incentives to a good worker? To put it plainly, abolition of the limit on the use of the wages fund will practically mean that it will be possible to pay a smaller number of workers more for more productive work.

In such a case will not "superfluous" people

appear? Such is possible within the bounds of a separate factory. This is definitely indicated by the experience of enterprises which participated in the economic experiment. But there cannot be "superfluous" people on the scale of the entire Soviet economy.

During the economic discussion some opponents reproached us for "encroaching" on the principles of centralised planning.

This dispute was of fundamental significance. It was held for a long time that the more items are covered by the centralised plan the better. The number of such items climbed from 400 to 18,000! The question is, what was there to be happy about? Some economists assured us that the "angel" of centralisation supposedly defeats the "demon" of spontaneity, that the plan conquers chaos. That naive delusion was refuted by life at every step.

The task of ordering all productive activity in detail, of covering everything down to the last bolt and every action of every economic unit, by materials lists and plan directives is not feasible for any State Planning Committee, no matter how wise are its staff. The only "merit" of such planning was that it nurtured bureaucracy in economic management and objectively favoured administration by order and voluntarism, now so vigorously denounced by the Party.

The system of centralised planning will only grow stronger when we clear it of details that cluttered it up. Only then can centralised planning concentrate its efforts on scientifically substantiating the rates and proportions of national economic development, on problems of technol-

ogical policy, the price system, finances, optimum correlation of consumption and accumulation. The latter is very important. We must not sacrifice the interests of the present generation for the sake of future generations. But nor must we slacken the rates of investment in the future development of production. And we can achieve this best, optimum combination by sharply raising efficiency in the use both of new capital investments and operating productive assets.

Some Soviet economists hold that the mistakes of maximum plan centralisation can be avoided by creating a countrywide ramified network of computation centres, uniting them in a single system and subordinating it to a kind of operational electronic Gosplan. But it is highly doubtful if it is possible for one centre, even if armed to "the teeth" by modern electronic devices, to direct such an intricate organism as a modern national economy.

I have little faith in a "push-button economy." I cannot imagine it is possible to build an ideal system of management only with the help of electronic computers. At definite levels the system must be closed, must be capable of self-regulation and the adoption of operational decisions on the spot. Otherwise, we will make mistakes or be late in taking decisions each time, even if there are computers of the highest speed and biggest capacity.

Electronic computers are a very powerful instrument of modern progress, and they also have to be used on a progressive basis. The role of man as a decisive force in management is

not weakened by electronic machines. On the contrary, it is elevated, raised, so to say, to the level of truly intellectual "heuristic" work in all stages of economic management.

The Directives of the 23rd Party Congress stressed the need for ensuring the proper combination of centralised planned guidance of the economy with initiative and independence of enterprises. On what basis, in what way should this unity be ensured? By more rigid regulation of the productive activity of enterprises and economic associations? Most certainly, not! This way runs counter to the whole meaning and purpose of the economic reform. There is good reason why the Directives of the 23rd Congress say that there must be no unjustified regulation of the economic and financial activity of enterprises.

Truly scientific, centralised planning is possible only by mastering the law of value. The law of value is the necessary and important instrument of agencies which direct social production. Today, casting overboard former prejudices it must be given a sufficient degree of freedom to be able, through *khozraschot*, profitability and material stimulation, and by meeting the needs of the organised socialist market, to improve and simplify the very process of achieving equilibrium and proportionality in developing social production, ruling out vexing disproportions and violations of the interests of the consumer.

In the current five-year period, the Party set the task of resolutely improving the supply system and preparing the ground for the gradual

transition to the planned distribution of equipment, materials and semi-manufactures through wholesale trade. What will this mean for the economy? The transition to the system of wholesale trade without the customary applications and allocations will, it is my deep conviction, be of colossal importance for the healthful development of the entire Soviet economy.

Transition to wholesale trade will demand a thorough study of requirements of raw and manufactured materials and equipment, the calculation of these needs scientifically and not by mere addition of requisitions.

There is one more important factor. Wholesale trade is impossible without reserves. The setting up of such reserves is a tremendous undertaking. Reserves will make it possible, at long last, to solve the problem of reliability and greater manoeuvrability of the supply system, of which we are thinking so much and for which we are so persistently striving.

With the rise in profitability ever bigger sums of money from the profit received by enterprises will go for improving production and providing material incentives to the personnel. Such stimulation will above all raise the living standard of the workers according to the results of their labour and the real benefit their labour brings to society. After all, encouragement will be given to the realised effect, not to the promise but to the real income received by the enterprise, the real output accepted and approved by the consumer.

An end will be put to levelling in labour remuneration, to a situation when the better

working personnel can be the loser. More favourable conditions will be created for genuine emulation between enterprises. An enterprise which works well will have profit and, consequenty, the possibility widely to reward its personnel and simultaneously to improve and expand production. Enterprises will thus have a real incentive to work more efficiently.

New Planning Methods and Prices

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Application of the new system of planning and incentives is one of the primary tasks of the Soviet economy in the next few years. Successful fulfilment of the new Five-Year Plan demands a rise in the efficiency of production through technological progress, improvement in the organisation of labour and production, a better use of productive assets and capital investments, improvement in the quality of goods, and the exercise of the strictest thrift.

The transition to new methods of planning and economic stimulation presupposes a radical improvement in the system of prices and price formation in the USSR. The existing practice of setting prices only according to the cost of production, without appropriate consideration of the net income obtained and the effectiveness of the goods in productive use or personal consumption is unsuitable to present-day conditions and to the requirements of socialist management. Inasmuch as the sum of profit included

in the price during such price fixing depends on the planned cost of production, enterprises are interested in producing material-intensive goods (that is, heavier goods or those produced from more costly raw materials, and the like) which is contrary to the interests of society. The size and level of profit (profitability) is poorly linked with the quality of goods produced, and the price correlations do not stimulate the choice of the more economical kinds of goods.

The creation of a system of prices and price formation corresponding to present-day requirements is a very intricate task. Price is an instrument exerting a far reaching effect. The level and correlation of prices greatly influence the profitability of production and the sale of various types of goods, and also the well-being of the various groups of the population. They influence decisions in designing, planning and economic management. All the main questions of economic growth are intertwined with the problem of prices.

In recent years research institutions have done much study of problems of price formation. These studies (their results are being partly applied) enable us to determine the main aims in improving the system of prices and price formation, namely: 1) to turn prices into a dependable instrument of technico-economic, designing, planning and operative calculations; 2) to enhance the role of prices and price formation in stimulating economic development and technological progress to the utmost; 3) to provide conditions for introducing full *khozraschot* at enterprises.

Today most economists recognise the following main principles of planned price formation, whose application will ensure the attainment of the above aims: a) the law of value is a law of prices in the socialist economy too; b) the socially necessary labour outlays which take into account the relevant asset-output ratio (assets needed per unit of output) serve as the basis of prices in the socialist economy; c) in the case of interchangeable goods consideration of their quality and effectiveness in consumption is obligatory; d) zonal differentiation of prices is needed in the extractive industries, differentiation based on the natural conditions in each zone; e) to ensure profitability of each enterprise normally operating on a *khozraschot* basis it is expedient in specific cases to use calculated prices; f) price correlations are designed to stimulate an improvement in the quality of goods, to promote technological progress, and to take into account the degree of satisfaction of society's needs in various kinds of goods; g) proper combination of stability and mobility (flexibility) of prices is also required.

The reform of wholesale prices now being carried out is a decisive stage in implementing these scientifically-based principles of planned price formation.

PRICES AS A RELIABLE INSTRUMENT FOR TECHNICO-ECONOMIC CALCULATIONS

Prices, as the monetary expression of the value of the products of labour, from their very economic nature must reflect, precisely and

uniformly, the social outlays in, and results of production. They must show exactly the cost society has to bear in satisfying its requirements. Only on this condition can the price system provide economic measures sufficiently precise to make it possible to choose the optimum goods and trends of technological progress, and to take the most rational decisions in planning, designing and management.

Some economists, simplifying the problem, think that to overcome the divergences in prices it is necessary to level profitability, to establish a single rate of profit for the entire national economy. In reality, a rational system of prices does not remove differences in profitability between various production sectors and kinds of goods. It makes profitability dependent on the economic efficiency of production and the use of various goods in accordance with the principle—what is of benefit to society as a whole must also be of benefit to the individual enterprise. The production of goods which are more useful for the economy must be more profitable for the producers, and at the same time these goods must be more advantageous to the consumers. Only then will the indicator of profit impel an enterprise to raise the efficiency of production and will it be possible to limit state assignments to the list of the most important goods. Enterprises will be economically interested in formulating and carrying out plans in full keeping with society's requirements.

Thus, the task of the forthcoming price reform is not to ensure some kind of equal rate of profit for all sectors and all kinds of goods,

but to have the rate of profit on different goods express, to the greatest possible extent, the correlation of the national economic efficiency of their production and consumption.

Under socialism, there are no objective conditions for the constant expression and accounting of the socially necessary labour outlays directly in units of labour time. This does not preclude the possibility and expediency of an approximate determination of the full labour outlays with the help of input-output tables and intricate economic computations. Regulation of planned prices on the basis of the socially necessary labour outlays is possible only through value. The law of value remains a law of prices in the socialist economy as well as in the capitalist.

A reduction of value, i.e., of the outlays of living and materialised labour per unit of output, makes it possible to satisfy society's requirements more fully with the same material and labour resources. This determines the role of prices which correspond to value, and also shows the importance of introducing in planning an indicator of the full labour outlays per unit of output. But this indicator is inadequate for expressing the national economic efficiency of production. One and the same magnitude of value, materialised in different goods, may be created with different relative investments in productive assets, because these investments are reflected in the cost of production and the value of the goods only through depreciation, whose share in the cost of production does not correspond to the asset-output ratio in different

sectors of production.

It should be noted that prices which coincide with value do not ensure conditions in which it will be possible to introduce payment for assets and to set up incentive funds everywhere. According to available calculations, profitability, in percentage of productive assets, will range from 2.1 to 99 in different sectors of production. Moreover, in the oil extracting, oil refining, gas, iron ore, sugar, and electric power industries, in trade, procurements and material supply profit will be less than 10 per cent in relation to assets.

The economic efficiency of production is displayed both in reducing operating outlays in the production of goods and in cutting the relative size of investments in productive assets. Planning and designing organisations have been taking this into consideration for a long time: by comparing and measuring current outlays and capital investments an optimum combination of both is determined. Planned price formation must also consider the point that the manufacture of more asset-intensive goods requires higher investments and that the best results are obtaincd by the economy only when optimally combining current outlays (as reflected in the cost of production) and investments in productive assets.

Investments in fixed and circulating assets hold a big place in society's outlays and it is important that they be considered not only when analysing the efficiency of production but also when fixing prices. Hence it is expedient to take the socially necessary labour outlays for the

production of the given goods and their relevant asset-output ratio as a direct objective basis of planned prices.

The asset-output ratio adds nothing to the entire value of the gross social product, the magnitude of which is determined by the socially necessary outlays of living and materialised labour for the production of goods. No price formation can increase or decrease value; it can only to some degree express it. To stress this point it is expedient to introduce the concept of "summed-up socially necessary labour outlays." They are obtained not by adding investments in productive assets to the input of living and materialised labour, but by correcting the labour outlays on separate kinds of goods depending on the relative asset-output ratio for each kind. Such corrections may cause a deviation of prices from current outlays of living and materialised labour which determine the magnitude of value. But such deviations should reciprocally cancel each other, moreover, not only on the scale of the entire gross social product but also of groups of interchangeable goods.

For planned prices properly to reflect the asset-output ratio of goods it is necessary to determine in a uniform way the efficiency of production in different sectors of the economy. Those who favour the price of production basis of price fixing insist on applying a single normative asset-output ratio (and so a single average rate of profit) for all sectors. But a single rate can uniformly express efficiency only if the efficiency of the productive assets them-

selves is the same everywhere, or if the evaluation of productive assets reflects the relative efficiency of their different elements.

The unequal economic efficiency of productive assets in various sectors of the economy is determined by their different composition. It is clear that the efficiency of the active part of the fixed productive assets (machinery, equipment) is higher than of the passive part (buildings, structures). Still higher demands as regards efficiency can be made on investments in circulating assets. Yet, the correlation of these elements in productive assets is far from the same. Thus, the share of buildings and structures ranges from 6.1 per cent (construction) to 75.1 per cent (oil extraction); the other elements of the fixed productive assets, from 3.3 per cent (trade) to 64.1 per cent (fish industry); circulating assets, from 1.2 per cent (oil extraction) and 2.9 per cent (electric power industry) to 73.4 per cent (clothing industry) and even 81.1 per cent (in construction, including uncompleted construction).

The second circumstance influencing the relative efficiency of productive assets is that investments in these assets have been made at different times. In our opinion, we can and should demand a higher return (output-asset ratio) from new investments than from the old which were made many years ago and were recouped in large measure or in full and are materialised in elements of the productive assets that are now technically obsolete. But the correlation of old and new productive assets in different sectors of the economy is also not the same.

Consequently, the reflection in planned prices of the relative asset-output ratio must be differentiated and must conform to the unequal efficiency (output-asset ratio) expected of various components of the productive assets. Failure to observe this demand will place enterprises and sectors in unequal conditions, and lead to excessively high prices of goods in sectors where a high asset-output ratio is a consequence of a big share of passive elements and old investments in productive assets. At the same time in some sectors (timber, food and other industries) accumulations are so small that many enterprises operate at a loss (owing to the different level of production costs).

To take into account the unequal output-asset ratio it is necessary either to differentiate the evaluation of productive assets, depending on the degree of efficiency of their different elements, or, when setting planned prices, to utilise differentiated asset-output rates.

It may be assumed that the correlation of active and passive elements of the productive assets is largely reflected in the time difference in the life of investments, because the passive elements do not go out of commission for a longer period. Therefore, from the angle of practical convenience it may be possible to limit ourselves to differentiation of the asset-output rate (or evaluation of productive assets) depending on the time factor. A maximum (in all cases single) rate must be applied to investments in new fixed productive assets and in circulating assets.

During the last review of wholesale prices in

1962-64, which remained uncompleted, the following principle was formulated as a basis for differentiating the level of profitability. Money accumulations (profit) should be included in the price on a scale required for pending capital investments and an increase of circulating assets in each sector. Practically, however, the application of this principle was limited, inasmuch as it would inevitably lead to raising prices of goods whose production had to be developed most rapidly (chemical and electric power industries, progressive sectors of instrument making, and production of effective building materials). This would counter the requirements of technological progress and the improvement of the structure of social production. In planned socialist economy the requirements of extended reproduction are satisfied not separately from the resources of each sector and each enterprise as they are accumulated, but on the basis of a single capital investment plan. Since the importance of the resources of enterprises and sectors themselves in covering their capital investments is steadily rising, planned centralisation and re-allocation of resources on the scale of the entire national economy are becoming an urgent necessity.

In the present reform of wholesale prices the principle of differentiating rates of profitability depending on the economic efficiency of productive assets has not as yet been fully applied. One reason is the absence of scientifically elaborated methods of such differentiation for definite types of goods. At the same time there are various reasons which cause a differentiation of these rates in the existing conditions. Such

reasons include the existence of some disproportions which cannot be eliminated before the introduction of new prices, the need for stability of retail prices, and for ensuring the profitability of all normally operating enterprises in all sectors, etc.

Differentiation of prices according to the asset-output ratio is one of the requisites for introducing payment for assets. Practical interests demand that the basic principles of accounting the asset-output ratio in prices and of fixing payment for assets should be unified to the maximum. At the same time it is important to bear in mind that the norms for the asset-output ratio and payment for assets must not coincide: a) payment for assets must be regarded merely as the minimum limit or required efficiency in the use of productive assets and therefore it, as a rule, will be lower than the norm for the asset-output ratio of various goods; b) in reflecting the asset-output ratio in prices, consideration should be given to the operating assets objectively needed for production, while payment will be made on all assets at the disposal of an enterprise (excluding those obtained on credit for which the enterprise pays interest to the bank).

Proper determination of the part of the net income to be incorporated in the price in proportion to the productive assets is of great importance. For practical purposes a simplified procedure has been adopted for the present reform. All money accumulations (except part of the turnover tax which is inseparably bound up with the formation of retail prices) are included in the

price proportionally to productive assets, which yields an average rate of profit of about 15 per cent. It seems reasonable to include in prices the part of the net income which has a direct bearing on productive assets, that is, which goes to increase investment. The standard asset-output ratio is determined as the relation of productive accumulation to the total value of the fixed and circulating productive assets, and this is the rate of productive accumulation. In practice this means adding to the cost of production a part of the net income amounting approximately to 8-10 per cent of the productive assets and another part amounting to 30-40 per cent of the wages.

The time factor, which plays an essential part in socialist planning, is taken into account by reflecting the relative asset-output ratio in planned prices. Experimental calculations of the Institute of Electronic Control Machines show that the use of prices with an addition of 20 per cent for productive assets makes it possible to choose an optimum variant of planning and designing decisions only for the next few years; for a period of 15 years the best variant is chosen if the asset-output ratio is estimated at 6-10 per cent and for a period of 20 years as 6 per cent and the prices coinciding with value (that is, without any account of the asset-output ratio of the goods). From this it follows that it is best of all to use prices which take into account an asset-output ratio of 8-10 per cent, which conforms to the rates of productive accumulation.

The practical importance of this limitation

consists in that the material incentive fund and the fund for social, cultural, housing and service expenses are formed at enterprises in proportion to the wages fund which varies by sectors of production differently than the size of the productive assets.

In view of this we suggest the following formula of a wholesale price based on the total socially necessary outlay:

$$P = MO + PW\,(1 + r') + r.c.\ FA$$

where MO is the material outlays for the given goods; r' is the rate of net income incorporated in the price proportionally to payment for work (PW); r is the rate of cost incorporated in the price proportionally to fixed assets (FA); c is the coefficient to allow for the asset-output ratio, depending on the composition of the assets and their economic efficiency. This coefficient can also be utilised for the re-evaluation of the productive assets. Prices set according to this formula ensure the least fluctuation of profitability and make it possible to fix payment for assets and to form incentive funds at the enterprises even at minimum profitability.

The setting of prices which best conform to the socially necessary labour outlays for the production of goods and take into account the asset-output ratio does not yet make price a sufficiently reliable instrument for technico-economic, planning, designing and operative calculations. To show properly the cost of satisfying different requirements, prices for interchangeable goods must be determined per unit of useful

effect in productive or personal consumption, in other words, per effective unit (for example, a unit of ideal fuel), according to the principle: an equal price for an equal satisfaction of needs. This proposition—to reflect the use properties of goods in planned prices—may now be regarded as generally recognised. The correlation of prices must take into account the quality, degree of interchangeability and relative effectiveness of different kinds, grades and brands of goods, making more progressive and better-quality goods attractive both to producers and consumers. Actually, this means to set prices for interchangeable goods or goods of different quality according to its social usefulness, to ascertain the socially necessary outlays of labour per unit of social usefulness.

The main obstacle hindering the application of the use properties of goods in price fixing is the absence of a scientifically-based system of indicators which would adequately define the use properties of each group of interchangeable goods. This will affect the results of the price reform. Adjustments of new prices will be needed with the elaboration and introduction of criteria for evaluating the use properties. Systems of indicators for such evaluation, and systems of concrete norms to specify the relative efficiency of goods in productive or personal consumption will be required.

The differentiation of prices according to the use properties of goods, can be done in the following ways:

1) by establishing separate prices for various kinds, brands and grades of goods. Such a meth-

od is expedient when there are essential differences in use properties, when interchangeable goods are produced in different industries and there are big differences in manufacturing processes.

2) by setting prices for the standard (basic) type of goods in the given group and elaborating a scale of bonuses or rebates for some deviations from the qualitative features of the standard article. It is advantageous considerably to extend the application of this method because it makes it possible to include in the incentive fund the additional income obtained by an enterprise as bonuses for improvements in the quality of goods, sharply to reduce the size of pricelists, enhance the flexibility of prices and provide the consumers with initial data for establishing the efficiency of the new articles.

3) by giving enterprises the right to stipulate by contract a bonus to prices for higher quality, precision of machining and special finishing. It is expedient to utilise this method in cases when there is no big need for articles with special qualitative characteristics. In future as the system of contracts is consolidated and developed the use of this method will be extended.

Proper calculation of the cost of production is essential for setting prices on the basis of the socially necessary labour outlays with the asset-output ratio and of the use properties. The importance of reflecting in the cost of production and in price the outlays on geological prospecting is now generally recognised.

THE ROLE OF PRICES AND PRICE FORMATION IN STIMULATING ECONOMIC GROWTH AND TECHNOLOGICAL PROGRESS

Some economists simplify excessively the intricate process of planned price formation and reduce the role of price to its function in planning and accounting only. They regard every deviation of prices from the socially necessary labour outlays as a sin, as blind imitation of capitalist planlessness, asserting that constant coincidence of prices with their basis, the socially necessary labour outlays, is possible and obligatory in planned socialist economy.

The Directives for the Five-Year Plan, adopted by the 23rd CPSU Congress, speak of enhancing the role of economic instruments in stimulating production. This fully applies to prices and price formation. Their role in economic development and technological progress is not exhausted by the establishment of a system of prices which allows proper technico-economic calculations. A number of factors objectively demand deviation of prices from the socially necessary labour outlays for the production of goods with allowances for the asset-output ratio and for use properties. Such factors are the employment of prices to stimulate the production and consumption of certain goods; allowance for the correlation between society's needs in the given goods and the possibilities of satisfying them; ensuring the necessary profitability of each normally operating enterprise; and allowance for circumstances of a transitory nature (for example, the dictates of

fashion, etc.). Utilisation of the system of prices and price formation is particularly important for accomplishing one of the most urgent tasks of the Five-Year Plan—improvement of the quality of goods.

It is not enough for the price system to ensure the comparability of indicators needed for choosing optimum solutions in planning, designing and in all practical management of the economy. It is important to make manufacturing enterprises interested in organising and extending the production of new machinery, progressive kinds of raw materials and consumer goods, while the consumers should be materially interested in buying and using them. This presupposes an appropriate procedure for determining prices of new kinds of goods.

The Economics Institute of the USSR Academy of Sciences, in co-operation with other research institutes, elaborated "Standard Methods for the Economic Substantiation of Wholesale Prices of New Kinds of Industrial Goods." Its major points resolve to the following.

The main criterion of the economic justification of prices of new goods is the optimum combination of the interests of producers and consumers. This is attained by setting upper and lower limits to the price of the new goods.

The economically permissible upper boundary of the price is the level at which the use of the new and the old (analogous) goods it replaces is equally advantageous for the consumer. Such a price is included in the assignment for the development of new kinds of goods as an obligatory parameter. The difference between it and

the calculated outlays has to indicate the degree of efficiency of the contemplated article. The upper boundary can serve as a basis for planned prices only temporarily, in cases when critical goods are produced, the demand for which should be restricted until the shortage is overcome.

The economically permissible lower boundary of a planned price is the level at which the manufacturing enterprise fully recoups the inputs for its manufacture, and is guaranteed a profit which makes the enterprise materially interested in organising and expanding the production of new goods. The additional profitability designed to stimulate the organisation and expansion of the manufacture of new, more progressive goods is made dependent on the degree of efficiency of the goods and is allowed temporarily, until full-capacity production of the new goods, or at least until the rise of the output to the level that fully satisfies the demand. The lower limit can be accepted as the planned price when the manufacture of the item it replaces is stopped, or when the scale of production of the new goods can be swiftly brought up to a point fully satisfying the demand at the given price level.

In all other circumstances the planned price must be established between the upper and lower limits. In practice this means that it is necessary to ascertain the proportion in which the economic effect of the introduction of the new goods as expressed in the difference between the upper and lower boundaries of the price is distributed between the producers and consumers of these goods.

In price formation it is very important to take into consideration the relation between demand and supply, actively influence them, regulate the sphere of consumption of different goods. This presupposes a deviation of prices from the socially necessary labour outlays. In particular, prices for economically effective goods in short supply are designed to confine their use only to spheres where it yields the biggest effect. Therefore, prices of shortage goods should be fixed at a higher level, not lower than the individual cost of production at the least efficient among the newly commissioned enterprises. A reduction of prices as the shortage is eliminated, moreover, at a faster pace, will help extend the sphere of application of such goods. For example, it is possible and evidently necessary to utilise prices for stimulating a saving of non-ferrous metals and also high quality steel, in the production of which non-ferrous metals in short supply are used as alloy components. Relatively lower prices of progressive kinds of goods manufactured in sufficient quantities will help to introduce them widely in the economy.

Enhancement of the role of prices and price formation in stimulating economic development and technological progress depends upon the flexibility of planned prices. Stability of the main correlation of prices is needed to ensure the stability of plan assignments. Account must be taken of the fact that in view of chain connections changes in prices of separate goods may bring about big changes in the conditions and indicators of production in a number of sectors. At the same time the continuous growth of labour

productivity, the reduction of the costs of production and circulation, the stimulation of technological progress, the manufacture and use of new goods and also the creation of normal conditions for retail trade, taking into account the seasonal nature of production and consumption, fashions, etc.—all this makes it necessary constantly to adjust prices. Therefore it is expedient: a) rationally to combine partial changes of prices, effected regularly and in close connection with the fixing of prices for new kinds of goods, with a general revision of prices; b) to differentiate the procedure of setting prices, in accordance with the socio-economic significance of the goods.

General revision of prices (not less than once in five years) is called upon to take into account the sum-total of interconnected changes in the socially necessary labour outlays, efficiency of production and the use of interchangeable goods for the period of the operation of new prices. It is impossible to accomplish this task through current partial changes of prices. But the role of these changes should be steeply raised preventing the formation of disproportions in prices.

The Directives of the 23rd CPSU Congress emphasised the significance of centralised planned guidance in the sphere of prices. Price formation is one of the main instruments of national economic planning and the price policy is an indispensable element of the economic policy of a socialist state. But excessive centralisation in this sphere produces adverse results.

A strictly centralised procedure of setting stable prices is undoubtedly necessary for major

kinds of goods which play a determining part in securing planned proportionality and a rise in the real incomes of the population. Alongside this, it is expedient to have prices set by local agencies within upper and lower boundaries fixed in a centralised way; prices set independently by local agencies with an eye to the general price level; prices set by economic agencies and enterprises in agreement with buyers.

It is very important to give enterprises an interest in reducing prices of the goods they manufacture as production costs are lowered. A considerable part in this respect will be played by direct ties between producers and buyers and the establishment of economic and financial dependence of enterprises on the sale of their output.

CONDITIONS FOR COMPLETE *KHOZRASCHOT*

One of the demands of a flexible price system is rationally to utilise a range of planned prices. This is necessary to ensure the profitability of each enterprise, operating on a *khozraschot* basis.

In the new conditions of planning and economic stimulation the size of profit and profitability will in large measure determine the contribution of each enterprise to the country's net income and will serve as a guideline for enterprises in raising the efficiency of production. This will sharply enhance the significance of scientifically substantiating the levels of profitability when fixing planned prices. This task is not fully solved by the fixing of prices which conform to the

total of the socially necessary labour outlays.

Enterprises operating normally should obtain a profit sufficient to pay for productive assets and natural resources and to form incentive funds. Practical experience and economic calculations show that single wholesale prices, based on the average sectoral cost of production, often cannot ensure compliance with this demand and so cannot create conditions for introducing complete *khozraschot* at enterprises. The differences in the cost of production at enterprises in these sectors, caused by factors outside their control are too great. Particularly big is the influence exerted by natural factors. According to available data inter-area variations in cost of production are at least 1 : 3 for timber and reach 1 : 25 for sand. For the main raw material resources (ores, coal, oil, grain) the difference between the highest and lowest levels of production costs is from 1 : 10 to 1 : 14. The differentiation in the cost of production at enterprises within each area is likewise great.

In these conditions the profitability of all normally operating enterprises necessary for complete *khozraschot* can be achieved either by fixing single wholesale prices which take into account the production costs in the worst natural conditions (principle of the maximum outlays), or a differentiation of prices for one and the same product between various producers. The first method is inexpedient, as demonstrated by the following facts.

The production cost of cement ranges from 6.18 roubles to 63.12 roubles per ton. The level of cement prices would have to be raised 4.4 times

for enterprises with the highest production costs to be able to operate without a loss. The minimum cost of extracting a ton of oil is 1.34 roubles and it reaches a maximum of 31.4 roubles, while the average price is 4.02 roubles. Consequently, the price would have to be raised almost 8 times for oil production to occur without a loss in the worst conditions. The picture is about the same in many other industries where the natural factor greatly influences the outlays for production and distribution.

A sharp rise in prices of goods in the extractive industries would (by chain reaction) lead to a general increase in the price level and ultimately to the need for a further increase in prices of the goods of these industries. In effect, this would mean resolving the contradictions between the individual and the socially necessary outlays completely in favour of the former, which is absolutely impermissible.

Planned organisation of production on the basis of socialist property makes it possible to secure normal conditions of reproduction at each enterprise, and to provide the necessary stimulus to utilising the worst lands and mineral deposits (if this is demanded by society's needs) not by basing sales prices on the worst conditions, but through territorial variation of prices for producers, including zonal procurement prices of agricultural produce and zonal or regional wholesale prices for goods of the extractive industries. If consumption of the given goods extends outside the production district (zone) throughout the country, zonal prices for producers are combined with a single price of these goods for all consu-

mers. If consumption is confined to the production region, then the territorial variation also extends to the sales prices. Zonal prices are set both for producers and consumers. In this case territorial differentiation of prices expresses the regional levels of the socially necessary labour outlays.

If there is a big differentiation of production costs within a zone, profitability can be secured to all enterprises normally operating on a *khozraschot* basis by a) orienting zonal prices on the cost of production in the relatively worse natural conditions in the given zone and introducing some form of fixed rental type of payments to the budget; b) by using group calculated prices or wholesale prices. The first method implies an increase in the redistributive role of the state budget. The second method redistributes money accumulations between enterprises within a zone. This presupposes a corresponding organisation of the sale of the goods—through sectoral and territorial supply agencies.

The introduction of payment for assets will make it possible to encourage a saving in capital investments and better utilisation of productive assets. The same applies to natural resources. The fact that these resources are free lessens interest in their rational use and encourages inefficient management. Thus, one of the reasons for large wastes of timber (which, moreover, is often burned and not utilised as a valuable raw material), is the low payment per tree and its extremely weak differentiation. The designing of some enterprises without their water supply can be explained by the fact that water is regarded as

a gift of nature and is not taken into account during the calculations of the efficiency of designs.

Orienting prices on the relatively worse natural conditions in a zone is tantamount to introducing payment for natural resources, differentiated depending on the quality of the deposits, their accessibility for extraction, use, etc. To determine the wholesale price of goods in the extractive industries it is then necessary to change the formula by including in it the fixed payment of a rental type (R), namely

$$P=MO+PW\ (1+r')+r.c.\ FA+R$$

Inclusion of fixed payments for natural resources in the cost of production, while it ensures the levelling of the latter, would enhance the significance of orienting zonal prices on the average zonal cost of production and would make the general formula of a wholesale price more applicable to goods of the extractive industries.

In setting the payment for natural resources, or the magnitude of the fixed payment of a rental type which is allowed in prices of primary goods, it would be wrong to extend to the entire volume of output the level of outlays characteristic only of a small number of the given group of enterprises. Thus, it is economically unreasonable to take the high cost of production (2.5 times and more above the average) at enterprises which contribute less than 15 per cent of the entire oil production as a basis for all enterprises in the industry. It is similarly inexpedient to base the price of lignite on the high production costs of mines which account for only 11 per cent of

the output. The Economics Institute of the USSR Academy of Sciences has analysed differentiation in the cost of producing grain in state farms of Novosibirsk Region between 1960 and 1963 for a preliminary estimate of differential rent in agriculture. If one-fifth of all the state farms with the highest cost of production which, as scientists consider, was caused by poor organisation of production, (they accounted for 11 per cent of the grain harvest) are excluded, the highest outlays to be taken as a basis in setting the price will exceed the average for the region not by 150 per cent, but only by 56 per cent.

Basing zonal prices on relatively worse natural conditions of production in the extractive industries does not preclude the need to apply calculated prices if the objective is to ensure some profitability, or at least operation without loss, even to enterprises which have a high cost of production and do not contribute a big share of entire output in the given zone. The application of calculated prices becomes even more necessary if account is taken of the use properties of interchangeable goods.

Fuel can serve as an illustration of how allowing for the use properties of interchangeable goods affects profitability. The prices of a ton of equivalent fuel which are in force for producers differ widely, and relative to assets spell either a loss (diesel oil, coal) or a negligible profit of 2.3-2.4 per cent. The fixing of prices for different types of fuel which conform to the total of socially necessary labour outlays and are equally advantageous to the consumer (allowing for transport expenses), leaves the coal industry with a

loss (although on a smaller scale) and sharply raises the profitability of diesel oil and especially of gas (up to 85 per cent of assets). If profitability of the coal industry be raised to 10 per cent of assets, profitability of oil products would climb to 81 per cent and of gas to 146 per cent. For all that, there would still be coal mines operating at a loss.

Calculations show that in view of the relatively low (as compared with the oil and gas industry) efficiency of the coal industry its profitability can be ensured either by violating the demand to equalise the price per ton of effective fuel or by setting prices of fuel much higher than the real outlays of social labour embodied in them. Evidently for the coal industry it is expedient to establish a low payment for assets and privileges along other lines and widely to utilise the system of calculated prices, the more so since conditions for profitable operation will grow worse as the share of oil and gas in the country's fuel balance rises.

One of the objections to calculated prices is this: a comparison of the cost of production and prices and the level of profitability should serve as graphic indicators of the relative national economic efficiency of producing the given goods at different enterprises, while calculated prices are hindering it. But is not the comparison of calculated prices for the same goods, set for different groups of enterprises, as much of a graphic indicator of different outlays at enterprises as a comparison of the rate of profit? It is only necessary to consolidate the procedure for determining and changing calculated prices, which would rule out

the possibility of concealing poor work in enterprises and would not lessen the stimulus to an improvement in their operation.

Territorial differentiation of wholesale prices and the use of a system of calculated prices will not be an obstacle (as is sometimes asserted) to proper economic calculations in planning and the operation of enterprises. It is only necessary to take into account the differentiation in zonal and calculated prices. Such accounting is also very important in determining prices for foreign trade contracts (the principle of compensating the utmost outlays or the outlays of the least efficient enterprises).

* * *

The limited extent to which the problems have been scientifically elaborated does not now allow us to apply fully the outlined principles in planned price formation. One of the urgent tasks of further studies is to elaborate and experimentally to test:

the methods and norms for calculating the socially necessary labour outlays for the production of definite goods, taking into account the asset-output ratio, including the methods of calculating planned norms of the efficiency of productive assets depending on their composition;

the methods of reflecting in prices the use properties of goods and systems of measurement of these properties, the ratios of equivalence in productive or personal consumption;

the methods and norms for calculating costs

of a rental type and their reflection in planned prices;

improved methods of accounting and calculating production costs (especially in sectors of automated production and in sectors which comprehensively utilise raw materials) which make it possible fully and precisely to reflect the real outlays on the production of goods, to eliminate expenses which do not have a direct bearing on the production and circulation outlays, and to compare outlays in different branches and sectors of the economy;

the methods and norms for establishing the territorial differentiation of prices and improving the practical application of calculated prices.

At the same time extensive research has to be done on theoretical problems of planned price formation related to the theory and methods of optimum planning.

The new system of planning, production management and material stimulation cannot rely on the existing prices. The creation of a new system of prices has become an urgent task, on the accomplishment of which the success of the entire economic reform largely depends. The introduction of new prices and a price formation system conforming to the present conditions will make it possible to utilise more fully and fruitfully all the commodity, money and value instruments for raising the efficiency of social production and accelerating the rates of economic growth and of technological progress.

Urgent Problems of the Economic Reform

A. BACHURIN, *Vice-Chairman, USSR Gosplan*

Consistent application and further development of the new system of economic management and planning is one of the decisive prerequisites for the successful fulfilment of the Five-Year Plan and an advance in the people's standard of living.

The reform affects not only fundamental questions of economic guidance, but also highly intricate problems of further improving the relations of production in socialist society. Of decisive significance in this respect is the improvement of planning, and the provision of greater economic incentives. Fulfilment of the measures mapped out in this sphere will make it possible substantially to raise the efficiency of the socialist economic system.

Improvement of planning, the extension of economic initiative and independence of enterprises and the enhancement of the role of economic instruments and material stimuli in industry are determined by the entire development of the economy and by objective economic laws. We have in mind not separate steps in one sector or another, but the whole system of interconnected measures affecting diverse aspects of the economy. It is a distinct feature of the economic reform that it must embrace all sectors of the economy, substantially accelerate technological progress and stimulate more intensive development of all social production.

Implementation of the measures outlined by the Plenary Meeting of the CPSU Central Committee in September 1965, and approved by the 23rd Party Congress, will ensure a more appropriate combination of centralised state planning and broad economic initiative of enterprises. It will increase the role of management methods based on the fuller application of socialist principles of *khozraschot* and commodity-money relations. In these conditions the practical use of socialist economic laws becomes a necessity, not only for the state, but also for each enterprise. Scientific analysis, consideration of objective laws of development in the various sectors of the economy and comprehensive study of the country's economic life are essential for the introduction of new methods of planning and economic stimulation, both throughout the entire economy and in each separate sectors. The initial experience of applying these methods at a few enterprises shows that their personnel are working energetically to bring to light internal potentialities and are beginning to study economic processes of production more deeply. They are paying greater attention, also, to more economical and efficient use of manpower and material resources. These enterprises are noticeably improving the indicators of economic performance, are more successfully fulfilling plan assignments for the sale of goods and for making profits, and are raising the efficiency of production.

The new conditions of operation provide broader possibilities for taking into account the contribution of each worker, for objectively assessing his initiative, ability and talent. This, in

turn, demands of all executives greater competence and better knowledge of economics. Under the new system, executives of enterprises must, together with the personnel, display more initiative and independence in solving economic problems and search for the most efficient methods of fulfilling the plan assignments.

TASKS OF PLANNING

The reform sets a number of major tasks before the national economic planning cadres.

To begin with, it is necessary *to raise the scientific level of planning,* to make a proper determination of the growth prospects of the Soviet economy, of the proportions in its development and of the best location of producing units and to solve similar national economic problems. This, in turn, demands a higher level of economic verification of plans, corresponding indicators and their elaboration for a longer future period.

The second main task of planning is to improve planned guidance and the setting of assignments to enterprises, in other words, this task deals with the *directive nature of plans*. While major indicators of the plan for both separate enterprises and the entire economy are to be preserved, the number of these indicators must be radically reduced. But in so doing the indicators are changed so as to facilitate to the utmost higher efficiency of social production, proper consideration for, and ever fuller satisfaction of society's needs. What indicators are these? In

planning production the volume of output sold must be such an indicator; in construction the commissioning of new productive capacity; in the transport system, evidently, the gross income.

It goes without saying that these indicators may differ somewhat in various sectors because of their special features. But the aim is that they should reflect to a greater extent the end results of an enterprise's operation, should dovetail production with consumption, and stimulate higher quality of output. Moreover, indicators in terms of value must be properly combined with indicators in physical terms, particularly those specifying the production of goods in physical terms and reflecting the quality of output. Consequently, the task is to enhance the role not only of value indicators in economic management, but also of indicators which promote an improvement in the use properties of goods and the more effective satisfaction of social needs.

In addition, enterprises also have indicators of profit, of profitability and the wages fund. In their sum-total the indicators employed under the new planning system are closely interconnected. Thus, a combination of these indicators, first, makes enterprises pay greater attention to the quality of their goods and to the satisfaction of the people's demands and the needs of the economy; second, it enhances the role of economic instruments in the operation of enterprises; third, it makes it possible to ensure the necessary correct proportions in the economy, above all between the growing effective demand of the population and the production of consumer goods.

These problems are of importance for all the

countries of the socialist community. Of course, the problem of proportionality is raised differently in the various socialist countries and, consequently, certain differences are possible in the system of indicators and in the way they are brought down to the enterprises. While in the Soviet Union these plan indicators will be approved by agencies standing above the enterprises, in Czechoslovakia, for example, the major plan indicators are submitted to the enterprises as guidelines.

These main indicators, together with economic stimuli, will make it possible fully to utilise commodity-money relations in the development of production and distribution. They conform to the system of economic stimuli which increase the role of prices, profit, credit and other economic instruments.

The new system of plan indicators, extension of the rights of enterprises in planning, and an advance in the scientific level of planning are closely linked with measures which offer greater material incentives to the workers. There is an organic link between these measures and the lines along which the economy is being improved, which is now being confirmed by practical experience.

FIRST STEPS OF THE REFORM

From the first quarter of 1966, 43 enterprises were transferred to the new system and from the second quarter, another 200. In conformity with the organisational plan adopted by the government, on July 1, 1966, the gradual changeover of

separate industries to the new system began with a view to completing the transfer within 1.5-2 years.

This applies first to sectors which have a sufficiently high level of profitability and other preconditions for applying all the principles of the new system. That is why in the immediate future, at the beginning of 1967, sectors primarily of the light and food industries will go over to the new system. It will be applied first in sectors in which new wholesale prices are being introduced or the prices in force allow the application of the new system. Such are the tobacco and tea industries, some sub-sectors of the engineering industry and the soda industry.

Experience confirms the correctness of the policy of introducing the new system gradually. This is done above all because in the process of transfer experience is accumulated offering the opportunity to improve the new system. At the same time, it is expedient to create the necessary preconditions for transferring enterprises to the new system. These preconditions are: first, improvement of the level of planning and supply, and, second, the introduction of new wholesale prices which as a rule ensure each enterprise operating normally a profit sufficient to pay for assets, to make the necessary payments to banks, to set up incentive funds, and to accumulate funds for the development of production.

It is necessary thoroughly to examine and weigh the possibility of applying different kinds of prices. We have grown accustomed to think that the only possible price is a stable state price. But the further development of commodity-

money relations presupposes the use of various forms and methods of setting prices. Thus, sometimes limited prices and prices directly set by the producer in agreement with the client are possible.

The experience of the first group of enterprises demonstrate that the basic principles, elaborated and approved by the September Plenary Meeting of the CPSU Central Committee are justifying themselves and producing positive results. The following figures will suffice. When 43 enterprises were transferred to the new system their approved 1966 plan for the volume of goods to be sold was raised by 0.8 per cent or 25 million roubles. Actually, in the first quarter these enterprises topped the enlarged plan by 3.7 per cent and their sales exceeded the target by 25 million roubles. Total sales rose 8.4 per cent as compared with the first quarter of 1965, and at some enterprises even considerably more. For example, at the Volgograd Steel Works they increased 10.4 per cent, the Voskresensk Chemical Factory 20.3 per cent and at the Second Moscow Watch Factory 35.6 per cent.

These enterprises undertook to raise the profit plan approved for 1966 by 2.4 per cent, but in the first quarter the increased plan was topped by 8 per cent. They received 8 million roubles of above-plan profit, while the profit plans of the enterprises had been raised by 11.4 million roubles as compared with the figures originally approved.

But this is far from everything that could have been accomplished at these enterprises. They have the potentialities for further expand-

ing production and the sale of goods and raising profitability. Suffice it to say that in the second quarter 200 enterprises were transferred in better conditions, as they had greater opportunities for preparing to work in a new way. For the second group of enterprises the originally approved plan was raised 2.1 per cent for the sale of goods and 4 per cent for profit.

It should also be noted that the 43 enterprises transferred in the first quarter considerably raised their labour productivity.

Questions of the sale of goods are of great importance. Daily production timetables are introduced at these enterprises and measures are taken to speed deliveries, machinery is improved and progressive manufacturing methods are introduced. At the same time they refuse equipment, which they consider superfluous.

An increase in the output of new, more modern articles and an improvement in quality are among the tasks of the new system which are being successfully accomplished, as shown by the experience of the first group of enterprises. They have accelerated the turnover of resources, are reducing above-norm stocks, are elaborating proposals for improving intra-factory planning and solving other problems connected with the application of complete *khozraschot*. But these, of course, are the initial results and it would be wrong to speak only of the positive aspects of the new system. We must also pay attention to shortcomings and, what is most important, to existing difficulties and take appropriate measures for eliminating them so that the system may function more efficiently.

The USSR Gosplan and planning agencies of the Union Republics and also the USSR Ministry of Finance, the Committee on Labour and Wages, the USSR State Bank and the Construction Bank play a particularly important role in the implementation of the economic reform. These economic bodies are called upon to co-ordinate and properly to direct all the work of transferring enterprises and sectors of the economy to the new system of planning and stimulation, to prepare and provide the necessary methodical instructions and also to sum up the experience of operation in the new conditions with the object of successfully applying the basic principles of the economic reform and improving them.

To these ends the USSR Gosplan has set up a department for the introduction of new methods of planning and economic stimulation, and similar divisions have been formed in a number of Gosplans in the Union Republics.

At the same time scientific institutions and above all the personnel of economic research institutes, and the faculties of economic educational establishments and departments have to render extensive assistance to enterprises, ministries, the Gosplan and other organisations working on the introduction and improvement of the new system and related economic problems.

KHOZRASCHOT IN PRODUCTION MANAGEMENT

The transfer of separate enterprises and of entire sectors to work in the new way are closely connected tasks. But they also have their essen-

tial distinctions. In the first case enterprises are chosen which have all the conditions for introducing the new system. At the same time, these enterprises in effect did not have complete *khozraschot,* which adversely affected all aspects of the industry's operation. It will be recalled that formerly, too, decisions were taken to extend the powers of executives of enterprises, but in reality they were not fully carried out and *khozraschot* frequently was of a formal nature.

The introduction of complete *khozraschot* at enterprises inevitably encompasses all the links of production management, both those which "stand above" an enterprise and those subordinate to it. Enterprises themselves are already elaborating the most suitable methods of planning and economic stimulation in the shops. Substantial achievements have been registered at a number of enterprises in this respect. Life is forcing them now to consolidate *khozraschot* within the enterprise.

Complete *khozraschot* at enterprises and the introduction of economic methods of management are closely linked with the consolidation of *khozraschot* at the higher levels, including *khozraschot* associations. It will be recalled that in a number of socialist countries the problem of *khozraschot* at higher levels is solved differently and with essential distinctions in various industries.

In the Soviet Union industrial enterprises are guided by Ministries and directly by central administrations which in most cases are not *khozraschot* organisations. In recent years *khozraschot* firms and associations have been or-

ganised in some sectors. But on the whole the problem of *khozraschot* in the higher levels of management has so far been insufficiently solved and has not been theoretically elaborated. This is one of the intricate problems in improving management and planning.

Improvement in the system of supplying enterprises is of particular importance for the success of the economic reform.The task above all is to bring the system of material supply and the work of the corresponding agencies which supply or sell goods into conformity with the basic principles of the economic reform.

Adequate organisation of supply in conformity with the demands of the economic reform would make it possible to release huge stocks of material resources scattered at numerous enterprises and concentrate them at territorial supply bases which satisfy the requirements of the enterprises upon application. The gradual transfer of the material supply system to the methods of wholesale trade is an important prerequisite for accelerating the circulation of material resources and raising the efficiency of production.

SECTORAL DISTINCTIONS OF THE REFORM

The transfer of industries to the new system has raised a number of questions. At the transferred enterprises incentive funds are formed depending on the growth in the volume of goods sold or profit, and the rise in the level of profitability. But in some industries we have many enterprises which do not ensure an increase in

the sale of goods, a growth of profit and even reduce the level of profitability; this is not always explained by the poor work of the executives or the workers of enterprises. In the coal industry, for example, the volume of production is steadily declining in about 30 per cent of the collieries. The question arises, on the basis of what indicators should incentive funds be set up at these enterprises?

Or let us take the electric power industry. We must not always encourage electric stations to increase the supply of electricity to consumers. We should rather raise the question of cutting the cost of generating electric power and of the economical consumption of electricity. What is the best way to set up and utilise incentive funds in this sector so as to stimulate an increase in labour productivity and a saving in the outlays of living and materialised labour? These questions require further study.

In July 1967, wholesale prices will be raised in a number of industries to ensure the necessary level of profitability and to enable each enterprise, operating normally, to pay for its assets, to set up material incentive funds, and also to have, in addition, a certain profit required for expanding production and repaying long-term credits. But we always have a certain number of low-profit enterprises and those working at a loss. The reform envisages that in such enterprises the required funds are to be set up from the money they save on their planned outlays. But this is too general a principle. Now it has to be elaborated more definitely for each separate sector. Such questions should be studied by Mi-

nistries, sectoral research institutes and also economic institutes.

The improvement of planning and economic stimulation, and matters pertaining to the introduction of the new methods are by no means simple problems. They demand a serious and concrete analysis of the state of affairs in each industry.

Two railways have been transferred to the new system and the volume of carriage has been preserved as the main indicator. It cannot be considered an ideal indicator because, all other conditions being equal, it is necessary to reduce freight carriage and not to increase it. Thus specific problems arise in each sector. Here is another example—the planning and bonus system in trade. The principles in force here are imperfect. They do not stimulate the workers to take all measures for expanding trade and speeding the sale of goods, especially those of which there is a sufficiency.

The transfer of industrial, construction, transport and trading establishments to the new system opens up quite a wide field of activity both for scientists and for practical economists, and we must by joint effort solve the urgent problems of improving planning and stimulation. The fact that we are introducing the new methods gradually facilitates the successful application of all valuable proposals.

Experience shows that the principles underlying the economic reform are correct and they should be applied undeviatingly. But this should be done in a creative and not in a stereotyped way to achieve the biggest economic benefit. The

task is to reinforce to the utmost economic methods of management, to stimulate the initiative of enterprises, to observe undeviatingly the principles of *khozraschot* and the material incentive principle. Successful accomplishment of this task will be an important factor in fulfilling and overfulfilling the new Five-Year Plan.

A New Stage in the Development of Agriculture

V. MATSKEVICH, *Minister of Agriculture of the USSR*

Agriculture is a vitally important sector of the Soviet economy. Its condition and development largely determine the country's economic achievements, the growth of the national income, the supply of the population with foodstuffs and many industries with raw materials and the rise in the living standard of the people.

Planned proportional and comprehensive development of agriculture is not only an economic, but also a major political problem, a problem of strengthening the alliance of the working class and the peasantry. In all its activity in agriculture, the Communist Party of the Soviet Union has been invariably guided by Lenin's behest—constantly to reinforce the political and economic alliance of the working class and the peasantry, the alliance of the two main classes of socialist society.

In recent years cardinal measures adapted to the new conditions and aimed at improving the guidance of the country's economy, at better co-ordination between industry and agriculture, and improved economic relations between town and country has been drawn up and applied. These measures meet the needs of Soviet society and the socialist economy. Of primary importance among them is the system of measures for the further development of agriculture, elaborated by the Central Committee of the CPSU at its Plenary Meeting in March 1965. In accordance with the decisions of that meeting, important steps have already been taken to improve the planning of agriculture in order to provide greater economic incentives for the expansion of production, and a basically new procedure in purchasing farm produce has been introduced. All these measures were approved and further developed in the decisions of the 23rd CPSU Congress. "The Congress attaches prime importance to the development of agriculture on the basis of the economic measures worked out by the March 1965 Plenary Meeting of the CPSU Central Committee," it is pointed out in the resolution of the Congress on the Political Report of the Central Committee. "The chief means of increasing the output of farm products is to consistently intensify farming on the sound basis of mechanisation, electrification and chemicalisation coupled with the wide development of land reclamation in areas with unfavourable natural conditions."

FOLLOWING LENIN'S DIRECTIVES

The Plenary Meeting of the CPSU Central Committee held in March 1965 brought to light mistakes and shortcomings and outlined concrete measures for eliminating them. The Plenum condemned the subjectivist approach to intricate problems of agriculture, but it also developed the Leninist principles of scientifically guiding this major economic sector in the new conditions. In a number of works Lenin repeatedly pointed to the need for comprehensively studying the real conditions and requirements of agriculture, and warned against the danger of hasty conclusions.

The Plenary Meeting in March 1965 was preceded by extensive preparatory work. The CPSU Central Committee enlisted a big group of specialists and scientists, workers of Party, Soviet and economic bodies to analyse the situation in agriculture and most objectively and correctly to reveal the causes of its lag, and to work out a system of measures which would ensure the speedy elimination of this lag, and the attainment of high growth rates in all sectors of agriculture. The wide business-like discussion of agricultural problems helped to bring to light shortcomings in leadership and to map out ways to eliminate them.

The main causes of the lag in agriculture, it was pointed out at the Plenary Meeting, were violations of the laws governing the development of socialist production, the principle of making the collective farmers and state farm workers interested in advancing the socialised economy,

and properly combining social and personal interests. Considerable influence was also exerted by subjectivism in leadership, which resulted in mistakes in planning, in financing agriculture, and in the price policy. Not enough capital investments were allotted for productive purposes and for the building of cultural and service establishments, and the material and technical basis was insufficiently expanded. Unjustified reorganisations of the leading agencies created an atmosphere of irresponsibility and nervousness, and inflicted grave injury on the collective and state farms. The Plenary Meeting also pointed to serious shortcomings in the purchases of farm and animal products and outlined measures for the radical reorganisation of the procurement system.

This system has a history of its own. Up to 1932, there was a contract system for the procurement of grain and other crops. In 1933, a system of obligatory deliveries, having the force of a tax, was introduced. The delivery of grain was based on the sowing plan and on the plan for animal products, that is, on the head of commonly-owned livestock. In 1940, this procedure was changed. The obligatory deliveries of grain and of some other crops were made on a per hectare of plough-land basis, and the deliveries of animal products on the area of all agricultural land the collective farm had in use. The Plenary Meeting of the Central Committee of the CPSU in July 1958 decided to abolish the obligatory delivery of produce to the state by the collective farms and also payment in kind for work done by machine and tractor, technical service and

specialised stations, and recommended going over to the purchase of farm produce. To determine the amount of produce which the collective farms should supply to the state it was considered advisable to adhere to the per hectare calculation of state purchases of the main products, specifically grain, potatoes, meat, milk, wool and eggs. At the same time it was recommended that the quotas of sale of these products should be further differentiated according to the specialisation of agricultural production. The procedure for calculating the deliveries was also changed, but the shortcomings in the system itself, which did not take into account the economic condition of the collective farms, remained.

The system of obligatory deliveries which guarantees the receipt by the state of a definite quantity of farm produce often hindered the development of the collective farms, did not promote specialisation and concentration of production, and restrained the initiative of the collective farmers. The same shortcomings were preserved when the system of purchases was introduced.

The March 1965 Plenary Meeting adopted radical measures for improving the system of purchases of farm produce.

To begin with a stable plan of purchases for 1966-70 was set, while expansion of production and above-plan sales of the commodities which the country most needs are stimulated by higher prices.

In drawing up the purchase plans the Plenary Meeting of the Central Committee recommended

a differentiated approach to each collective farm, taking into account the prospects of its development, specialisation, and the need to concentrate on output needed for expanding the farm and satisfying the personal needs of the collective farmers.

The proposal on the stability of purchase plans aroused much argument. Some objected to stable plans on the grounds that the country's needs in grain and other farm produce are steadily rising and that it is necessary to have extended reproduction. Yet, this decision of the Plenary Meeting is of profound significance. The approach to the organisation of agricultural production is changed and an atmosphere of confidence is created. Today a collective farm board or state farm manager, receiving a plan for five years in advance and knowing what the state expects of the farm, together with the collective farmers and state farm workers will be able to determine the crop rotation system, the disposition of the sown area, etc., having no fear that next year the assignment would be changed and it will be necessary to revise the dispositions again. At the same time the establishment of higher purchase prices stimulates above-plan production and sales, which serves the interests and needs of the state.

There were other objections too: Why was the plan for grain purchases set at 54,400,000 tons, while the country needs state grain reserves and has to satisfy export requirements? To create grain reserves the Plenary Meeting of the Central Committee proposed that voluntary above-plan purchases at higher prices of the

main food grains, wheat and rye, be organised in collective and state farms. This decision also makes the collective farms materially interested in expanding grain production.* Thus, the establishment of a stable state plan of purchases and the new prices of the main grain crops lay a solid economic basis for grain farming and make it possible to end the low profitability of grain production in collective and state farms in a number of zones. On the other hand, this decision also affects farm specialisation. It is perfectly clear that purchases too will be concentrated gradually in places where there are better conditions for growing grain and its production costs are lower. Consequently, specialisation of grain farming will not be shaped spontaneously, and will be introduced, not by administrative measures, but by economic measures, with the help of such a sensitive instrument as prices.

To create conditions for raising the profitability of the farms and for increasing accumulations designed for expanding production, the March Plenary Meeting found it necessary to increase the purchase prices of wheat and rye, buckwheat, rice, and the more valuable varieties of millet, and also to add bonuses to the existing purchase prices of cattle, pigs and sheep.

The Plenary Meeting also decided to increase deliveries of machinery and fertilisers to the collective and state farms to further extend the

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* In 1966, the payment of higher prices for above-plan sales was also extended to millet, feed barley, oats, maize and peas.

use of electricity in agricultural production and to increase capital investments. In the new Five-Year Plan capital investments in agriculture will amount to 71,000 million roubles which is almost equal to the investments in the first 19 post-war years.

Extensive measures to render financial assistance to collective farms have already been carried out in conformity with the decisions of the Plenary Meeting. Debts of economically weak collective farms on state bank loans of more than 2,000 million roubles have been cancelled and the procedure of taxing the incomes of collective farms has been changed.

Rapid progress has occurred in all sectors of agriculture since the Plenary Meeting in March 1965. The collective and state farms have gained a clear perspective, and have a definite economic basis for further development. The task of intensifying and specialising agriculture has been put on the order of the day in its full magnitude.

Fulfilling the decisions of the March Plenary Meeting, many areas and regions have drawn up assignments for the sale of produce to the state for five years, taking into account the specialisation of the farms. The plans of purchases have been drawn up with consideration for the existing conditions and trends which generally were not specialised but diversified. The changeover to deep specialisation will, evidently, be made gradually, through swifter growth rates in the leading sectors.

Implementation of the measures drawn up by the March Plenary Meeting has already pro-

duced positive results.

It will be recalled that in 1965 bad weather conditions prevailed in a number of main agricultural areas, particularly in grain growing regions. A serious drought hit western Siberia and northern Kazakhstan and a number of other grain growing districts. The gross grain harvest in 1965 was below 1964 and amounted to 120.5 million tons. This notwithstanding, gross agricultural production was higher than in preceding years, chiefly because of a substantial increase in the output of animal products and raw cotton. A good harvest of sugar beet, sunflower seed, flax, potatoes, and other vegetables was gathered. The collective farms gained in strength organisationally and economically. Money incomes in 1965 were 2,500 million roubles above 1964. The income of the collective farmers both in money and in kind rose.

Thus, the results of 1965 in agriculture convincingly demonstrated the great vital force of the Party's economic policy elaborated at the March Plenary Meeting of the CPSU Central Committee.

MAIN TASKS OF THE COLLECTIVE AND STATE FARMS

Questions of the further development of socialist agriculture were thoroughly examined at the 23rd CPSU Congress. It determined the main tasks which should be accomplished by the collective and state farms in the current five-year period and the measures ensuring their

fulfilment. "In agriculture," it is pointed out in the Directives of the 23rd CPSU Congress, "the central task is to achieve a considerable increase in the output of farm and animal produce with the object of satisfying more fully the population's growing needs in foodstuffs and industry's needs in agricultural raw material. The implementation of this task must be founded on the consistent fulfilment of the system of economic measures elaborated by the Plenary Meeting of the CPSU Central Committee in March 1965."

The Congress mapped out measures to strengthen the productive forces in the countryside, to eliminate disproportions between industry and agriculture, to improve social relations in the countryside and to enable the living standard of the rural population to approach the generally rising living standard in the Soviet Union as a whole.

Average annual agricultural production should increase by 25 per cent in five years as compared with the annual average in the preceding five years. As before, grain farming will develop at a faster pace. The average annual grain crop is to increase by 30 per cent and brought up to 167 million tons annually as compared to 130.2 million tons in 1961-65.

The Directives of the 23rd Congress outlined big tasks in the development of animal husbandry, increasing the production of meat, milk and wool, which can be achieved mainly by raising productivity and also by increasing the herds of livestock and the number of poultry. Alongside the accomplishment of these two major inter-

connected tasks—increasing the output of grain and animal products—it is intended substantially to raise the production of cotton, sugar beet, oil-bearing seeds, flax and other industrial crops, potatoes and other vegetables, tea, fruit, berries and grapes.

An increase in the harvest of all crops can be achieved mainly by raising all yields. "As before, it is the most important task in agriculture to increase the production of grain. Raising the yield from each hectare of land is the decisive condition for accelerating the growth rates of agriculture in general and of grain production in particular."

While in the past the problem of increasing the production of grain and other farm produce was solved mainly by expanding the sown area, now these possibilities are limited. That is why the main practical source for increasing the grain harvest is to raise yields. To fully meet the country's grain needs it is necessary to bring up the total harvest to 180 million tons annually in 1970 or to increase the yield of grains by not less than 400-500 kilograms per hectare.

This is a difficult but feasible task.

An increase in the yield of grain and other crops is ensured by a number of factors:

First, the system of agronomical measures. Within two or three years all collective and state farms have to restore or introduce new crop rotation systems and attach them to definite teams. This will establish an unbreakable chain: crop rotation—team—machinery. Today agricultural agencies everywhere have started to survey and assess the land, to restore and introduce

crop rotation, and to develop and apply zonal systems of farming, etc.

Second, deliveries to collective and state farms of up to 1,790,000 tractors, 550,000 combines, 1,100,000 lorries and other machinery, which will considerably reduce the time required for agricultural work.

Third, an expansion of the irrigated areas in the South and in Central Asia by 2.5-3 million hectares and also the drainage of land in overmoist areas (not less than 6 million hectares). Estonia, which obtained 2.2 tons of grain per hectare on the entire sown area, reveals the great potentialities for increasing grain production on reclaimed and fertilised lands in the non-black earth belt.

Fourth, an increase in the deliveries of mineral fertilisers up to 62-65 million tons, an improvement of their quality and an increase of the primary nutrient to 35-37 per cent.

An improvement in farming methods, and of seed growing, better quality of all work and also a proper combination of moral and economic stimuli, the provision of greater material incentives to raise yields are all of prime importance for increasing the production of grain and other crops.

The March Plenary Meeting of the CPSU Central Committee and the 23rd Party Congress thus elaborated an entirely new approach to urgent problems of agriculture. A programme of large investments in the main means of agricultural production, the land, has been drawn up for the first time in the history of the Soviet Union, a programme which by its scale will

make it possible to lay a solid foundation for the intensification of agriculture. In these conditions the advantages of large-scale planned socialist agriculture will be displayed with especial force. Intensification of agricultural production, the creation of large specialised farms and entire districts will make it possible in a brief period steeply to raise the output of high-quality produce and simultaneously to reduce the expenditure of labour and resources.

THE POLICY OF RAISING YIELDS

The Soviet Union has large land resources. There are 610 million hectares of agricultural land and 225 million hectares of ploughland. This is immense wealth, and the main resource for the production of crops and animal products. But as a result of the swift growth of population and a number of cases of an unthrifty attitude to the soil the available ploughland per capita is slowly declining. In 1953 there was 1 hectare of ploughland per capita, while today, despite the ploughing up of many millions of hectares of new lands, the figure declined to 0.97 hectares. There have also been unfavourable changes as regards the quality of the soil.

In view of the contemplated large capital investments in land, chiefly to increase the application of mineral fertilisers, land reclamation and irrigation, questions of a thrifty attitude to the land, its conservation and proper use acquire exceptionally great importance.

First of all, it is necessary seriously to approach the removal from agricultural use of

large areas which are used for all kinds of construction and industrial purposes. In the last seven years, for example, more than 7 million hectares, including 4.5 million hectares of agricultural lands, have been taken up for these purposes. A check-up has shown that valuable lands, and even irrigated areas and flood-plains, have often been assigned for these purposes. In recent years 3.2 million hectares of agricultural and more than 4 million hectares of forests (which were of importance for water conservation) have been flooded by reservoirs of operating and future hydroelectric stations. In the coastal zone of the reservoirs the land becomes marshy on huge areas while the flood-plains below the dams, as a rule, have dried up and their fertility has declined.

Undertaking now a huge programme of investment in the land, and of intensifying agriculture, it is necessary above all radically to change the attitude to the land.

Alongside this, we have to apply a system of measures to protect the land from the spontaneous action of natural destructive forces. Vast areas in Siberia, Kazakhstan, the Volga region, North Caucasus and also in southern Ukraine and the Central Black-Earth Belt, where the main grain growing farms are located, suffer from disastrous droughts and from wind and water erosion, which make grain farming unstable. In the forest-steppe and steppe districts the run-off of heavy rains and melted snow, and haphazard tillage result in the washing away of the fertile top soil and the swift development of gullies.

As a result, the hydrological regime is worsened and the supply of moisture is reduced.

The Soviet Union has farms with good practical experience in developing stable and highly efficient crop growing in the steppe and the forest-steppe districts. The Dokuchayev Agricultural Research Institute in the Talov District, Voronezh Region, is a case in point. It has a large farm known as the Kamennaya (Rocky) Steppe, with 13,000 hectares. To grow stable crops it applied measures for the retention of the run-off of melted snow and heavy rains, planted 647 hectares of shelter belts, and set up 53 ponds with irrigated sections. Efficient farming here is based on scientific crop rotation. These measures have raised the level of the subsoil waters, increased the moisture reserve in the fields between the shelter belts, and brought up the yield of grains to 2.3-2.5 tons per hectare in 1953-65. The experience of the Institute is being applied by other farms which are also obtaining stable yields.

Protection of the soil from wind erosion is a particularly acute problem in the eastern steppe regions. Wind erosion has actively spread in recent years, especially in some areas where virgin and disused lands were ploughed up, where, alongside land suitable for cultivation light-textured soils were ploughed, using stereotyped cultivation methods unsuited to local conditions. But in these areas too it is possible to rectify the mistakes made, to check the dust storms and make grain farming more stable and productive. This is graphically demonstrated by the experience of the USSR Grain Farming

Institute located in Shortandy, Tselinograd Region. Thanks to the use of clean fallow, mouldboardless ploughing, leaving the stubble on the surface of the soil, the sowing of grains at the best times and the use of other special cultivation measures the Institute has succeeded in obtaining relatively stable wheat yields in drought conditions. The average grain yield in the Institute's farm from the total sown area of more than 24,000 hectares, is twice as high as that in nearby collective and state farms.

Soviet farmers now possess sufficient knowledge and experience to be able to carry out, in each collective and state farm, a range of measures to protect the soil from the effects of natural forces and a proper system of hydrotechnical, afforestation and agronomic measures to preserve and raise soil fertility.

The decision on the extensive development of land reclamation to obtain high and stable harvests adopted by the Plenary Meeting of the CPSU Central Committee in May 1966 is aimed at solving this problem. This decision continued the line of intensifying agriculture, mapped out by the March 1965 Plenary Meeting of the CPSU Central Committee and developed by the 23rd Congress of the Communist Party.

The May Plenary Meeting decided to increase the area of reclaimed lands in all zones to 37-39 million hectares in 1975 as compared with 15 million hectares at present. During these years 9 million hectares of ploughland and over 20 million hectares of meadows and pastures will be improved, and 28 million hectares of acid soils will be limed.

Extensive measures are planned for improving the physical properties of the soil, combating erosion and restoring and developing shelter belt planting. The necessary money and other resources will be allotted for irrigation and water conservation projects. In the new Five-Year Plan more than 10,000 million roubles will be spent for these purposes as compared with 5,600 million roubles in the 20 post-war years.

The irrigated and drained lands, in addition to further increasing the production of valuable industrial crops, should become a reliable source of grains, above all wheat, rice and maize.

The elaboration and introduction of modern cultivation methods conforming to the latest developments of science and technology, and to the requirements of intensive farming is of great importance in the effort to raise yields. This above all applies to areas where large-scale drainage and irrigation are to be carried out.

Elaboration of cultivation methods in present-day conditions is an intricate and responsible matter. The role of the agronomist, engineer and livestock expert as production organisers is especially enhanced. Modern agronomy and allied sciences and also practical farming are becoming ever more complex and differentiated. Today an agronomist can no longer be "self-contained." To apply the most progressive cultivation methods he must be able efficiently to utilise data of a number of sciences, including plant breeding and agricultural chemistry, to apply the entire range of biological, chemical and agronomical measures which protect the plants from pests, diseases and weeds. He,

together with the engineer, must choose machines which ease labour, create the best conditions for the development of the crops and at the same time activate favourable processes in the soil. Lastly the agronomist, together with the economist, or utilising the latter's calculations, must properly assess each measure and choose those that will be most efficient and productive in the concrete conditions of the particular farm.

IMPROVEMENT OF SOCIAL RELATIONS

To carry out the Plan for agriculture it is necessary further to consolidate and develop the forms of organisation in both the collective farms and state farms, and to improve social relations in the countryside.

The collective and state farms by their entire record have demonstrated their vitality and their indisputable advantages over any other type of farm. These advantages can be effectively utilised given two conditions. First, there must be strict observance of the basic economic laws, including above all the law of planned proportional development of sectors of the economy, and also the principle of making the agriculturist materially interested in increasing output. Second, there must be highly qualified technological guidance of the main sectors of production in the collective and state farms. Naturally, there are also other conditions affecting the development of socialist agriculture, but these are the main, the decisive ones.

Both the collective farms and the state farms

have accumulated vast experience in organising modern large-scale agricultural production. These two forms of organisation of socialised farming have much in common, but they also have differences. For example, the production processes in the collective and state farms are the same, but the forms of management and payment for work differ.

The general membership meeting is the highest administrative body in a collective farm. That is why a collective farm has more independence than a state farm in solving economic problems, in determining the trend of capital investments, the sequence of construction, etc. Payment for the labour of the collective farmer depends chiefly on the results of the farm's operation as a whole and on his personal work. Thus, the collective farmer is materially interested in improving the operation of the farm. At the same time, until recently, he had no guarantee that if he worked well his labour would be correspondingly rewarded. Poor work of the board or chairman of a collective farm or other reverses affected first of all the payment for the work of the collective farmers.

In conformity with the Directives of the 23rd Party Congress, the CPSU Central Committee and the USSR Council of Ministers on May 16, 1966, adopted a decision on enhancing the material interest of the collective farmers in developing social production, a decision of great economic and socio-political significance. The decision advises collective farms to introduce, as of July 1, 1966, monthly guaranteed payment for the work of their members (in money and

in kind) comparable with the wages of corresponding categories of state-farm workers. Output standards will be set with an eye to the concrete conditions and as compared with the standards in the state farms. The new methods of payment for work in the collective farms in effect signify an improvement in the system of distributing their incomes, and consolidate a different approach to the fund for payment for work. The decision envisages that in distributing incomes in the collective farms money to pay for the work of the members must be allotted as a first priority. If the farm does not have enough of its own funds to pay for the work, it can obtain credit in the state bank for a term of up to five years, within the limit of the sums allocated in the plans for the long-term financing of collective farms. The implementation of these measures, like the establishment of pensions for collective farmers,* has become possible as a result of the country's general economic advance, and the consolidation of the collective farms.

State farms have their advantages and shortcomings in both the organisation of management and payment for work. In a state farm each worker has guaranteed earnings, the size of which depends on the results of his personal labour. But a state-farm worker is not sufficiently interested in the results of the farm's economic activity as a whole. Whether the state farm has a profit or a loss, this does not affect the

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* The pension law for collective farmers was passed by the USSR Supreme Soviet in 1964.

earnings of the worker. The more precise system of management in state farms has its shortcomings. One-man management frequently leads to undesirable consequences. That is why the question is raised in the Soviet press of the wider democratisation of management in the state farms and broader participation of agricultural specialists and workers in managing production. It is suggested that the system of wages in the state farms be so remodelled as to make each worker more interested materially in the end results of the whole farm's operation.

At the present stage of communist construction the forms of organisation in both the collective farm and state farm have not exhausted their period of usefulness. In this connection the wholesale conversion of a large number of collective farms into state farms was a serious mistake in the past, and it was condemned by the March Plenary Meeting of the CPSU Central Committee. At the same time it is expedient systematically to exchange the experience accumulated by collective and state farms over many years.

The Directives of the 23rd CPSU Congress on the Five-Year Plan pay special attention to the organisational and economic consolidation of the collective and state farms and the improvement of their economic activities. In the current five-year period state farms are to be transferred to complete *khozraschot,* and internal *khozraschot* is to be reinforced in the collective farms. The rights and responsibilities of executives and specialists for the results of operation are to be increased.

One of the major tasks of the new Five-Year Plan in agriculture is to make further strides in eliminating distinctions between town and country and in raising the material and cultural standards of the rural population. The production and technical level of agriculture will draw nearer to that of industry. The fixed productive assets in the collective and state farms will almost double and will be essentially renewed in five years.

The Directives of the 23rd Party Congress envisage that the growth in the technical facilities of agriculture, its intensification, better organisation of labour and the provision of greater material incentives to agriculturists will serve as a basis for raising labour productivity in the collective and state farms by 40-45 per cent, for reducing production costs and increasing the profitability of farming. This will make it possible substantially to accelerate the growth rates of the incomes of collective farmers and state farm workers. Implementation of these measures and also the introduction of guaranteed pay for the work of the collective farmers will help to draw closer together the living standard of the rural and urban population, will promote the further consolidation of the alliance of the working class and the peasantry, and will strengthen the unity of the entire Soviet people.

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The March 1965 Plenary Meeting of the CPSU Central Committee, relying on the Leninist methods of management and the comprehen-

sive scientific analysis of agricultural production, elaborated the principles of the Party's economic policy in agriculture at the present stage of communist construction. The main content of these principles is to strengthen the role of economic methods and stimuli in guiding agriculture, radically to improve the planning of agriculture, extend the economic independence and initiative of the collective farms and state farms, and to enhance responsibility for, and the material interest of the collective farmers and state farm workers in the results of their activity. The 23rd CPSU Congress fully approved the decisions of the March Plenary Meeting of the CPSU Central Committee, and mapped out specific measures for the development of agriculture during the new Five-Year Plan.

THE FIVE-YEAR PLAN AND SCIENTIFIC AND TECHNOLOGICAL PROGRESS

Problems of the Efficiency of Science in the Present Period

P. RACHKOV, *Master of Philosophy*

THE ECONOMICS OF RESEARCH

The period of communist construction is marked by an unusual rise in the role of science in developing all main aspects of social life. Science is increasingly becoming a decisive factor in developing the productive forces, the basis for guiding social progress, and a prime requisite for moulding the communist world outlook. The 23rd Congress of the CPSU clearly demonstrated that the need of socialist society for advanced, progressive science is rising with the country's successful march towards communism. "The building of the new society requires a level of scientific knowledge unprecedented in history both for the development of the productive forces and for the transformation

of all social life," as was pointed out in the Report of the Central Committee to the 23rd CPSU Congress. This is becoming especially clear now when the scale and tasks of theoretical research are rising still higher. The growing need in science is caused by the acceleration of Soviet society's social, technological and cultural progress and the consequent inevitable increase in the number of theoretical problems and the greater complication of tasks in developing production and guiding social advance. In these conditions the scale of scientific studies and the improvement of their organisation, efficiency and use become a primary question of the country's further advance.

The Communist Party of the Soviet Union is resolutely opposed to any digressions from science towards subjectivism and voluntarism. It favours an organisation of scientific studies which ensures the greatest participation of science in running and planning the economy, in developing socialist democracy and in promoting the progress of socialist culture. It will be no exaggeration to say that the contemporary scientific and technological revolution has now placed the efficient work of scientific institutions in the same rank with questions of productive efficiency in industry. The task of rationally utilising research workers is now in the same rank with the scientific organisation of labour in industry. The scientists directly connected with solving production and economic problems, no less than the economic directors have to take fully into account the forces, resources and possibilities and scientifically calculate the economic

efficiency of scientific institutions and research workers. This is necessary above all for raising the productivity of labour in research which is now acquiring exceptional significance. A. N. Kosygin in his report to the 23rd CPSU Congress stressed the need "for research, especially in natural science and technology, becoming the most productive sphere of social labour." This is all the more important today because scientific endeavour in the Soviet Union now encompasses a vast army of more than 660,000 specialists, and the number of people engaged in the development and introduction of new technology is considerably above two millions.

All this creates an urgent need for comprehensive development of the science of science, in which great attention will be paid to the *economics of research,* i.e., to scientific knowledge specifically connected with the analysis of the economic efficiency of the development and application of science. The economics of science must play an important part both in studying a given science and in appraising its practical importance. It will make it possible clearly to define the specific features of the scientific "production" and its industrial application, which, evidently, in many respects differs from the production and use of industrial or agricultural commodities. The economics of science will help many scientists and research establishments better to organise their activity.

We would like to give a general review of economic efficiency in the application and "production" of science. We shall first examine

the main sources of the efficiency of science, and then some problems and difficulties related to its practical application. In so doing we must stress that this article deals only with the *economic* efficiency of science, and not with all the problems of the efficiency of science, which naturally are not confined only to the economic aspect. Not all the sciences, particularly many of the social and general theoretical branches which play a big part in the life of society, have exact economic yardsticks. The efficiency of such sciences on the whole is directly determined not by economic, but by other indicators which should be specially examined.

SOURCES OF SCIENCE'S ECONOMIC EFFICIENCY

The economic efficiency of science is displayed above all in the high profitability of applying it, i.e., in the ability of science to save investments, cut costs, and increase profit. Usually, the cost of "scientific" agents of production (machines, mechanisms, equipment) is much smaller than the profit accruing from their application. This is explained by the fact that science makes possible the extensive use in production of natural forces: energy of the sun, atoms, wind, steam, electricity, atmospheric pressure, etc. In contrast to machines, which have a value that is transferred to the product, forces of nature have no such value. The use of science to make machines which replace human labour by natural forces in the production process, necessarily re-

duces the cost of goods and, while increasing the wealth of society, does not increase the value of this wealth to the same extent.

This distinction of science is seen most clearly in our day. According to *World Science Review*, an American journal, in the course of 25 years US industry received from 20 to 50 dollars profit for each dollar invested in research. Other sources (*Paint Industry Magazine*) name even a figure of 60 dollars.

This is characteristic of many production sectors. Thus, each dollar spent on research in the electronic industry is recouped five or six times over, according to American data. In the Soviet Union five million tons of metal and 500 million roubles were saved from 1959 to 1963 thanks to the application of the findings of the physical, chemical and technical sciences in welding.

Modern chemistry is also noted for high economic efficiency. Its application makes it possible to reduce usual costs by 65-75 per cent.

The possibility of a tremendous saving by applying science has made it one of the most efficient and important spheres of investment.

The high profitability of applying science in industry is determined by three groups of factors connected with (1) the industrial application of science, (2) the specific features of the "production" of scientific discoveries, and (3) the effective dissemination of scientific and technical knowledge. Let us examine first of all the factors of the first group which consist in the ability of science *to save fixed capital* and *raw materials* (i.e., to raise the economic efficiency of the

means of production), effectively *to save human labour,* and so *to save labour time.*

The ability of science to save fixed capital and raw materials is demonstrated particularly by the contemporary scientific and technological revolution. One of the results of this revolution is a reduction in the *capital* required *per unit of output* or, in other words, a swifter growth in the efficiency of the fixed means of production as compared with the capital needed per unit of output. New technology enables fixed capital to transfer an ever smaller part of its value to each unit of output.

As a result of faster technological progress the application of machinery increasingly resembles the use of natural forces. "The less value it gives up," Karl Marx pointed out in the last century, "... the more its services approximate to those of natural forces." (*Capital,* Vol. 1, p. 390).

US data, for example, show that while, prior to the '20s, a reduction in unit outlays of living labour was combined with a simultaneous increase in the outlays of fixed capital, subsequently, in view of more "scientific" production, unit outlays of fixed capital showed a tendency to decline like the outlays of living labour. From 1929 to the present, the amount of capital per unit of output in the United States declined approximately by 40 per cent and the efficiency of the fixed means of production rose by about 70 per cent.

Simultaneously the scientific and technological revolution is also stimulating another important process—the *reduction of the unit material consumption,* which also considerably reduces

the required capital investments. Chemistry, which is an indispensable "supplier" of exceptionally efficient and cheap artificial materials, plays a special part in reducing the outlays of raw and other materials per unit of the end product. The production of plastics, for example, requires usually from 50 to 67 per cent less capital investments than are needed for the production of the non-ferrous metals they replace. Moreover, chemistry allows the use of production wastes thus creating "the matter of new capital without the prior expenditure of capital," as K. Marx put it.

In many countries the industrial use of artificial raw materials, especially chemical products, is swiftly growing. From 1938 to 1950, it rose eight times in the economically developed countries, while the use of natural raw material and fuel rose by less than 50 per cent. At the same time the ratio of outlays for the production of artificial raw materials to the value of all output rose only from 0.008 to 0.031. This clearly indicates a substantial reduction in the value of the raw material in the goods produced. In the Soviet Union this process will be greatly developed in the current Five-Year Plan which, as pointed out in the Directives of the 23 rd Party Congress, should result in doubling the output of the chemical industry.

Further, science is a source for the ever greater *saving of human labour,* the prime requisite of all social production. Embodied in technology, science makes it possible to employ natural forces for the performance of physical and "mental" functions of the manufacturing process. The

higher the level of science and technology, the smaller the mass of labour which operates the given mass of machinery and equipment.

This law is displayed with special clarity in the application of electronic computers, some of which are capable of doing the work of tens of thousands of people engaged in calculation, releasing them for other jobs.

An automatic transfer line also yields a big labour saving. Machines which formerly were operated by 55-60 workers are frequently served only by two or three men. On the average the use of automatic lines reduces the number of production workers, as shown by Soviet experience, by nearly 80 per cent.

It is estimated that the application of scientific and technological achievements in ten years (1960-70) in the Soviet Union will save the labour of as many workers as were engaged in all social production in 1960.

This means that the greater output and use of electronic computers, automation devices and other highly efficient instruments will be an important source of manpower for many national economic projects which will be commissioned under the new Five-Year Plan.

The ability of science to save means of production and especially human labour is closely linked with its ability to *save labour time*. Its role in this sphere is very great. For example, the long process of prospecting for, and mining diamonds is even hard to compare, as to duration with the process of producing artificial diamonds which takes only a few hours. According to chemists in the German Democratic Republic, one

man-hour used in the production of mineral fertilisers makes it possible to raise the yield to an extent corresponding to the product of approximately 20 man-hours in agriculture.

At present, "the swift introduction in production of scientific and technological achievements," A. N. Kosygin noted at the 23rd Party Congress, "is a decisive factor in raising the productivity of social labour." For its influence on labour productivity the industrial application of science considerably exceeds any other condition of production, whether the skill of the worker, the size of the means of production or natural conditions. Science embodied in means of production raises labour productivity tens and hundreds of times. In agriculture, the application of such products as herbicides raises, according to Academician S. I. Volfkovich, labour productivity in grain farming from 20 to 30 times.

It is not by chance that science and its industrial application are assigned a decisive part in the new Five-Year Plan in ensuring a new tremendous growth in labour productivity.

The high economic efficiency of science is determined not only by its direct impact on production processes, its role in saving the basic components and factors of production, but also by the relative value of the scientific studies themselves, the specific features of the "production" of discoveries and their "moral" ageing. Here three characteristic factors should be mentioned:

(1)the relatively *low cost of scientific discoveries*;

(2) *the huge discrepancy between the value of the scientific discoveries made public and their*

original cost (the former is incomparably lower than the latter);
(3) the exceptional *longevity of scientific discoveries* and their improvement and development in the course of application.

The first of these factors consists in that the expenses incurred by society in achieving scientific results, as a rule, are recouped many times over by applying scientific discoveries in production. Thus, in the Soviet Union the economic return due to research done by the Mining Institute of the Siberian Branch of the USSR Academy of Sciences and applied in 1962 alone amounted to 80 million roubles. This sum greatly exceeded the outlays on maintaining the Institute.

There is reason why each well-functioning scientific institute is now compared in economic efficiency with several large factories.

The same ratio of social expenditure to income also applies to the employment of many specialists. At American factories about 25,000 dollars annually were allotted for each specialist in production organisation in 1955-56. The income resulting from the use of their services amounted to about 30,000 dollars (See *Statistical Abstract of the US,* 1957, pp. 319, 495). According to data of A. G. Kurakov, in the Soviet Union a scientific worker on the average helps increase production approximately by 50,000 roubles annually (See *Socio-Economic Problems of Technological Progress,* Moscow, 1961, p. 390), which evidently is several times greater than society's expenditure in remunerating his labour.

Further, the price of theorems, formulae and laws discovered and proclaimed by science has

always been *incomparably smaller* than their social value, an important prerequisite for the wide practical application of science. To discover the secret of releasing atomic energy (utilising, of course, the earlier store of knowledge, which from the economic viewpoint is mainly "free") scientists needed at least 33 years (if we consider the fundamental formula $E\text{-}mc^2$ deduced by Albert Einstein in 1905 as the beginning, and the splitting of the atomic nucleus by Otto Hahn at the end of 1938 its definite completion). But a man who has the necessary knowledge can apply the discovery (that is reproduce it) within several hours or days. This means that the time necessary for the application of a scientific discovery is almost incomparable with the labour time necessary for its original development. In view of this, the achievements of science, its theorems and laws which have become public knowledge, no longer cost a penny, as Marx put it.

The advantage of the non-original production of scientific data is amply demonstrated by modern cybernetics which clearly establishes the absence of direct conformity between the value, originality, or effectiveness of information and the energy outlays necessary for its transmission and reception.

As a result, it is possible almost completely to exclude from the expenditure on scientific activity the discoveries which have already been made and have become public knowledge. Such saving can be greatly hampered by artificial measures, particularly by making scientific data secret to protect state and private capital invest-

ments in science and also by shortcomings in scientific information work. To avoid unjustified losses, it is necessary, as pointed out at the 23rd Party Congress, to organise in the Soviet Union a highly efficient countrywide system of scientific information and to buy more patents and licenses abroad.

That scientific discoveries which have an objectively true content, essentially *never age, are never "worn out" in the course of use,* is an important element which enhances the value of science.

New discoveries and achievements in science do not annul or cast aside the old ones (if the latter, of course, are truly scientific), but supplement and improve them, *incorporating them* as a particular case.

In contrast to machinery, mechanisms and most structures, scientific achievements serve society practically an unlimited time. Such are the laws of Archimedes, the axioms and theorems of Euclid, the laws of Newton, Mendeleyev and all other scientists who furnished *objectively true* knowledge of natural processes.

Such "immortality" of scientific discoveries greatly raises the efficiency of science and reduces the relative cost of its development.

Lastly, the third group of factors related to the economic efficiency of science includes the *high degree of recoupment* (profitability) *of scientific and technical training of people,* the great economic efficiency of propaganda and dissemination of scientific knowledge. As a rule, the income of society from such activity greatly exceeds its expenditure on education. This is due to

the fact that greater scientific and technical knowledge in the minds of people noticeably lengthens the life span of machinery, essentially improves the results of its employment and helps improve manufacturing processes. Academician S. G. Strumilin, a noted Soviet scientist, has calculated, for example, that the productivity of a university-trained man in the Soviet Union is 11 times greater than the cost of his education.

On the whole, each rouble spent on school education, i.e., on teaching the fundamentals of science, raises the country's national income by a minimum of six roubles annually. The basic outlays of society on propagating scientific and technical knowledge, are fully recouped and also bring a big income. This is tangibly felt, especially in socialist society, which can purposefully and effectively organise the entire system of scientific and technical training in the interests of society as a whole. Utilising this possibility, the 23rd CPSU Congress elaborated a big new programme for raising the general educational level of the Soviet population and extensively training personnel through the system of general schools, special schools and higher educational establishments.

The great economic efficiency of science has ensured its penetration into literally all pores of social production, and has turned it into a primary source of industrial progress. More than half of the entire increase in the consumption funds in the Soviet Union now depends on the economic results of the work of scientific institutions and designing organisations.

To exploit fully the potentialities of science considerable "additional" work is needed to ensure the free realisation of its economic potential: on the one hand, to find ways for the elimination of some of the "adverse" sides of scientific activity and, on the other, and this is particularly important, to create the most improved social conditions and organisational forms for the development and application of science.

Scientific endeavour as such does not furnish any direct economic advantage. Money spent on science rarely reveals an immediate prospect of return. This applies particularly to modern theoretical studies, the practical significance of which it is in general impossible to ascertain at once (the discovery, for example, of new elementary particles, study of the period of existence of a free chemical radical, etc.). But without these studies there is no genuine science, there is no scientific knowledge that gives a direct benefit. Theoretical studies have now become the basis of new, most efficient categories of production, a requisite for changing the fundamental principles of manufacturing processes. To live up to their designation they must constantly run ahead of production and greatly exceed in scale the research that is directly applied in practice.

Thus theoretical studies by themselves cannot act as a directly productive force. To be embodied in new manufacturing processes they must pass through a number of intermediary stages. Moreover, the costs of theoretical studies by far do not exhaust all the appropriations for the in-

dustrial application of science. It is also necessary to prepare the discoveries for productive application, i.e., to make additional scientific investigations, to prepare engineering designs, to build pilot plants, etc. These "applied" expenditures frequently exceed the cost of the initial scientific study thousands and even tens of thousands of times. But even they do not yet yield a directly productive effect. Further special work is needed to design a production installation or factory, and subsequently, to introduce the discoveries in production. All this creates a number of additional difficulties, which require considerable effort to overcome. So far, it was pointed out at the 23rd Party Congress, there still exists an unjustified gap between theoretical investigations and their technological, designing elaboration. Moreover when making investments in science it is necessary to take into account beforehand that much research will be fruitless. Many achievements of science result not in new positive solutions of problems, but in a demonstration of the falsity, or barrenness of specific trends and methods of work. Hence investments in science, as John Bernal remarked, always involve a definite risk.

We have pointed out earlier that in our days total appropriations for science are noticeably lower than the income resulting from its application. But these outlays are quite substantial. In the Soviet Union the state expenditure on science in recent years has amounted to 5-6 per cent of the entire state budget. In 1966, this expenditure is to reach 6,500 million roubles.

In future the growth rate of expenditure on

science will most likely decline, and, as many specialists think, the total share of society's expenditure on science will in time become stabilised and will not exceed a definite optimum limit (up to approximately 5 per cent of the value of the national product).

The constant growth of research expenditure hardly indicates a tendency to reduce the general rate of profit on appropriations for science. Rather the reverse is the case. At present, this rate shows a tendensy to grow because the increase in outlays on science is accompanied by a no less swift increase in the "returns" on these investments, and a faster rate of application of scientific discoveries. Fifty years ago, as a rule, decades passed between the discovery of a new phenomenon or material and its practical use. This period has now been sharply cut. Thus, only three years passed from the discovery of the fission of the uranium nucleus to the development of the first nuclear reactor, and only fifteen years to the commissioning of the first atomic electric station. In 1954, Soviet scientists discovered the principles of quantum electronics and today they are already utilised in technology, medicine and instrument-making. But to ensure steady growth in the general rate of profit on investments in science it is necessary steadily to improve the links of science and production, to have, as A. N. Kosygin put it, "a well-functioning system for the planned organisation and systematic stimulation of the swiftest and most efficient introduction of the results of research in industry."

Ultimately, all problems associated with the stimulation of the revolutionary force of science,

with the rise in its efficiency, find a rational solution in improving the social conditions of its development and application. Science as a product of *social* activity can thrive only where its social nature develops unhindered.

Translating this possibility into reality, the Soviet Union has created a single and effective organisation of science which has enabled it to take a leading place in a number of major trends of world scientific and technological progress, to register outstanding successes in the development of atomic physics and technology and in the exploration of outer space.

But the Soviet Union also has to accomplish a great deal in order fully to utilise the vast economic potential of science. So far, as pointed out at the 23rd Party Congress, the organisation of work in research institutes, the selection of personnel, the placement of scientific forces, and the use of economic and moral incentives frequently do not sufficiently promote an improvement of research, bold scientific quests and close links of science with production. The scientific forces of higher educational establishments are not yet utilised in full measure. Material and financial resources are not always concentrated on the main trends in the development of science and technology. The elimination of these and other shortcomings demands, alongside the elaboration of a number of philosophical and sociological problems of science, the accomplishment of many specific tasks.

In particular it is very important to elaborate the principles and methodology of determining rational relationships in theoretical and applied

research so that science should constantly provide a necessary "backlog," thus unfolding the perspectives of technological and social progress. This task has been, and remains, a problem of great theoretical and practical significance. It is not accidental that during the discussion of methodological problems of the natural and social sciences in the USSR Academy of Sciences in 1963, it was treated as one of the central methodological problems. Its solution demands intricate calculations, connected with the provision of conditions for the maintenance of a flexible equilibrium between the main kinds of scientific work—theoretical and applied, including development, and questions of finance, training and allocation of personnel. Their complexity will constantly rise, inasmuch as the new Five-Year Plan presupposes, as A. N. Kosygin pointed out, swifter development of both basic theoretical and applied research.

Creation of all the necessary requisites, especially social and organisational conditions, for the development and application of science will fundamentally enhance its role in fulfilling the Five-Year Plan.

The Electric Power Industry: Present and Future

M. VILENSKY, Master of Economics

The accomplishment of the main economic task of the new Five-Year Plan is inseparably linked with the acceleration of scientific and

technological progress, with the re-equipment of the entire Soviet economy, with progressive changes in its structure and further industrial development of all sectors of social production.

The application of scientific and technological achievements in production at the present stage requires the solution of big and intricate scientific and technical problems, which involves the outlay of large funds and cannot be achieved in a relatively short space of time.

Five-year economic development plans must be based primarily on trends of technological progress elaborated in recent periods. But the planning of these trends and their implementation must not overshadow the planning of long-term trends: while introducing the technology of today, we must not forget the technology of tomorrow. The dialectics of development in this sphere is such that each achievement of scientific and technological progress applied today already contains elements of ageing. That is why in each five-year plan the foundations must be laid for utilising the technology of tomorrow. These foundations consist not only and not so much in applying promising trends of technological progress on an industrial scale but in elaborating them in laboratories and research institutes and finding the economically most acceptable design solutions.

BASIS OF TECHNOLOGICAL PROGRESS

Electrification is the basis of technological progress. But this, above all, applies to the main and decisive trends at the present stage in the

development of the productive forces—comprehensive mechanisation and automation. The country's thorough electrification, which will be continued in 1966-70, is decisive for the development of these trends. To begin with, the level of electrification will be raised in lagging sectors, agriculture, public utilities and the services. All communities in the country will be electrified, while stationary processes in agriculture, chiefly in animal husbandry, will be mechanised with electric drive. For these purposes electric power supply to agriculture will increase threefold. In industry auxiliary processes, which in large measure are still not mechanised will be electrified. Electric traction will be further extended on the railways.

An accomplishment of these tasks will largely determine technological progress in all sectors of the economy in the current five-year period. Greater electrification of the public utilities and services is an essential factor in improving the people's living standard.

In view of the achievements of the scientific and technological revolution, electrification can no longer be limited to the above-enumerated trends at the present stage in the development of production. The time is not far distant when comprehensive mechanisation and automation will be completed in Soviet industry. For all the importance of comprehensive mechanisation and automation of production processes, these trends do not change the basic principles of the traditional mechanical processing of material, but merely improve it. Yet, the development level of the productive forces enters into a contradiction

with the traditional mechanical working of materials. Further growth requires radical, revolutionary changes in the processing of objects of labour, changes capable of sharply intensifying production processes and giving an impulse to creating entirely new instruments of labour and changing man's position in these processes.

Processing is the link in the production cycle which is becoming the decisive arena of scientific and technological progress.

Radical changes in methods of processing materials are possible through electrification. The universal nature of electric power allows for its active introduction in processing, for the direct treatment of materials and replacement of mechanical by electrical methods, which increases the consumption of electricity. The main merit of electrical processing methods is that they accelerate manifold treatment, reduce labour outlays, raise the quality of the goods and make it possible to obtain articles with pre-set properties. Electrical processing methods are continuous in action and therefore their control yields more easily to automation than many mechanical methods of treatment.

Soviet science has elaborated a number of effective electrical processing methods. These include electrophysical and electrochemical methods of treating heat-resistant, rustless, magnetic and other high-alloy steels and also such hard materials as silicon, germanium, ferrites, rubies and diamonds (electroerosion, electrocontact and radiation methods, treatment by ultrasound). Among the electric processing methods are also electronic ionic methods based on

the use of the action of a strong electric field (electric separation of gases and bulk materials, electric concentration of minerals, electric painting, electric spinning). Serial manufacture of a number of electrochemical, electroerosion, electrocontact and electroradiation machines has been undertaken.

The introduction of new electric processing methods does not mean that less attention should be paid to the development of such electric production methods which have become traditional as the production of aluminium, electric steel, ferroalloys, zinc, copper and a number of rare earth elements. These types of production, whose origin was from the very beginning linked with the use of electricity, will be greatly developed since the goods they contribute serve as a basis for advancing other important trends of scientific and technological progress.

But in the present five-year period development of electronic processes cannot as yet become one of the main trends of technological progress. To begin with many methods of treating material by electricity demand "final development" at laboratories in institutes and factories and then in pilot plants. Moreover, industry must organise production of special equipment and machines for the treatment of materials by electricity. Lastly, to transfer industry to electrical processing it is necessary also to carry out some organisational and technical measures. Among them should be the establishment of institutes for the elaboration of the scientific principles and technical specifications for the introduction of electrical processing and also for designing

special installations and equipment.

The establishment of special firms which on a contract basis would do the entire range of work needed for introducing electrical processing methods directly at enterprises in different industries will also be an important organisational step forward.

Provision of these organisational and technical conditions and also more profound research to extend the sphere of application of electricity in production will make electrical processing a highly promising trend of future technological progress in the field of electrification. But a start must be made in the present five-year period.

INTENSIFIED PRODUCTION OF FUEL

Solution of urgent problems of electrification and also the accelerated introduction of electrophysical processing dictate the need for accelerating the growth rates of the electric power industry. Although electrophysical processing of materials raises the efficiency of electrical as compared with mechanical treatment, its accelerated development demands a substantial increase in the production of electric power and, what is most important, electricity has to become cheaper.

Scientific and technological progress raises the unit consumption of electricity in all sectors of the economy. At the same time there is a tendency towards greater power consumption in industry, both by extending the use of gas in thermal production processes and by developing the

chemical industry, where in many sectors fuel performs simultaneously power and processing functions. All this increases the need for power resources. Moreover, the demands on their efficiency made by the economy sharply rise, inasmuch as greater unit power and electricity consumption relatively raises power outlays in production costs. Yet economical power resources are not limitless and they are irreplaceable. As deposits with favourable conditions for production are exhausted, the reserves of economical fuel decrease. As a result, with each passing year the cost of a ton of consumed fuel rises. Thus, the gap between the growing need for cheap power resources and their limited reserves is widening. Moreover, power resources are spread very unevenly. Ninety per cent of them are concentrated in areas east of the Urals, in Siberia and Central Asia, while 80 per cent of the fuel and power consumption is concentrated in the European part of the country. As long as economical methods of using the new sources of power—the energy of thermonuclear reaction—capable of ousting the traditional power resources, are not developed scientifically and technologically, it is necessary, first, to raise the proportion of mineral fuel extracted from the earth, second, to increase the rate of extraction of useful energy from fuel, and, third, to create new, reliable and economical means of transcontinental transport for carrying and transmitting large masses of fuel and power from East to West over distances of 4,000-5,000 km.

The methods of extracting mineral fuel now employed make it possible to extract less than

half of the reserves of the exploited deposits. If we consider that under the existing methods of power generation only 40-45 per cent of its potential thermal energy is utilised, it will become clear that the national economy uses efficiently approximately 16-20 per cent of all the reserves of the fuel deposits. As new fuel-producing enterprises are commissioned the volume of unextracted reserves increases. At present, the unextracted stocks of oil run into thousands of millions of tons. Such utilisation of the natural resources is a result not of mismanagement in the usual sense of the word, but of the backwardness of the entire range of power technology, beginning with production of fuel and ending with utilisation.

Measures designed to intensify the extraction of fuel, above all of oil, must be carried out in the next five years. This should become one of the main trends of technological progress in the fuel industry. In the oil and gas industry such measures have been elaborated and are being successfully applied. Among them are various methods for the artificial maintenance of high pressure in the seams, and also methods for the secondary working of oil and gas deposits that were abandoned earlier owing to the drop in the natural seam pressure. These methods have raised the oil yield efficiency from 0.2-0.3 to 0.48 in the last 20 years. Their improvement will make it possible to increase the oil yield somewhat more. This will not solve the problem of raising the yield at fields with a heavy, viscous oil. Scientific investigations and practical experience have demonstrated that thermal treatment of the oil

seam by pumping in either hot water or steam, electric heating of the seam, and the creation of combustion centres therein, are highly efficient methods for intensifying oil production at such fields. These methods make it possible both to intensify production at operating wells, and also to resume it at abandoned wells.

As a result of experimental electric heating five hundred low-yield wells in various areas raised their yield by 60 per cent. The cost of production of the additional oil is much lower than the cost of oil obtained without electric heating. According to data of the USSR Ministry of the Oil Industry, this method should be introduced at 11,000 wells with the daily yield of up to 5 tons each. These wells will additionally provide more than 3 million tons of oil annually.

Thus high growth rates in oil production, envisaged in the Five-Year Plan, will be achieved above all by intensifying production, and increasing the yield of the exploited seams.

In the coal industry so far main attention has been concentrated on developing mining equipment that will ease the labour of the miner and replace it to the utmost at relatively low depths. For all the importance of this trend it is time to undertake the development and application of measures to raise the rate of coal extraction. This problem is particularly important in the Kuznetsk coal field, the biggest in the country, which is unique as to its number of seams, their thickness, depth and diversity of the composition of the coals. Yet, from 20 to 40 per cent of the coal in the collieries of this area remains unextracted. Seams up to 1 metre thick are not worked at all

as a result of which more than 30 million tons are lost annually.

Higher coal extraction from Donbas pits is also quite important. Science is facing the task of elaborating and introducing a range of equipment for mining coal at depths from 1,000 to 5,000 metres.

Another side of the problem of satisfying the growing needs of the economy in fuel and power—raising the level of the extraction of potential thermal energy from fuel—is of no less importance for technological progress in the power industry. The urgency and importance of this aspect of the problem is determined by the fact that of the 6,385 teracals ($6{,}385 \times 10^{12}$ cal) of power contained in the fuel produced in 1964, only 2,594-2,873 teracals or 40-45 per cent were extracted. This means that of the 912 million tons of reference fuel produced in that year approximately 500-545 million tons were lost. Of course, today not all these losses can be technically prevented. But as regards a considerable part this is possible. For this it is necessary radically to improve the power apparatus of the national economy.

POWER APPARATUS AND ITS IMPROVEMENT

Available data show that large, highly productive units, noted for high technical level, prevail in the power apparatus of the Soviet Union. Suffice it to say that in the total number of prime movers steam turbines account for 59.6 per

cent of all the installed capacity and turbines with a capacity of more than 50,000 kw for 42.7 per cent.

In 1965 five units with a capacity of 300,000 kw each, 46 units of 200,000 kw and 53 units of 150,000 kw each were in operation.

But alongside big modern power units a large number of low-efficiency small-capacity installations were also in operation.

A large programme of technical re-equipment of the railways is being carried out in the USSR. The share of steam traction in total freight carriage declined to 39 per cent by expanding diesel and electric traction. This sharply increased the consumption of fuel. But a large number of steam locomotives are still in use.

Technical improvement of the power apparatus in the current five-year period should proceed along the lines of discontinuing the building of small boiler houses and electric stations, dismantling uneconomical autonomous boiler houses and electric stations and the faster building of district condensation and heat-and-power plants equipped with units of great productivity and of high parameters.

A 300,000 kw unit must become the main type of thermal turbine in 1966-70. At the same time the serial manufacture and use of 500,000 kw turbines should be organised and the manufacture of turbines with a capacity of 800,000 and 1,000,000 kw with super-high steam parameters should be started. Corresponding to these types of turbines should be high-capacity boilers so that big stations should be built of boiler-turbine units. In the next five years metallur-

gical works and oil refineries at which power wastes are especially high should be fully equipped with recuperating units (recuperation boilers, installations for the evaporative cooling of furnaces, etc.). Large-scale manufacture of gas turbines and the building of electric stations with a steam-gas cycle, making it possible to raise thermal efficiency to 30-35 per cent, should be undertaken and, lastly, the share of atomic electric stations in power production should be raised.

Transmission of 750 kV a.c. and 1,500 kV d.c. should be developed in order to deliver large quantities of electric power from Siberia to the European part of the country. The building of these transmission lines should be undertaken in the second half of the five-year period.

Improvement of the power apparatus for the extraction and conversion of the thermal energy of fuel, as pointed out above, is an urgent and paramount task of technological progress in the present Five-Year Plan. A solution of this problem will make it possible to satisfy the ever growing need for power with less fuel. This will create more favourable proportions between the fuel-producing and fuel-consuming sectors and ultimately yield a big saving of funds in fuel production which will repay the outlays for improving the power apparatus.

But this progressive trend in the power industry, for all its importance, cannot bring about radical changes in the production of power. It leaves the technology of this process unchanged. However much improved the power apparatus may be, the principles of its work in converting

the energy of fuel into heat and electric power remain unchanged. As hitherto, this process will be based on a multiplicity of conversion phases, which inevitably causes big power losses. Moreover, the efficiency of fuel utilisation cannot exceed 40-42 per cent. In the power industry, as in manufacturing, progress in technology runs up against the relatively conservative nature of the production process which results in big irreversible losses. That is why the technical improvement of the power apparatus must be regarded as a task of technological progress in the next five-ten years.

Simultaneously it is necessary to work on the main problem of technological progress in this sphere, namely, to radically change the process of producing power and cut losses to a minimum during the extraction of energy from fuel and its conversion. This is a task of vital importance because the mounting pace of progress in the country's entire economy is expected to multiply power needs by 12 to 15 times by the end of the 20th century. To satisfy these needs with the present methods of extracting and converting the energy of fuel, fuel production will have to be increased at least six times even if the highest technical efficiency of the power apparatus is achieved. In other words, fuel production will have to reach an astronomical magnitude hardly possible with the ever shrinking reserves that are economically available.

The general outline of such a change in the methods of producing power has already emer ged. It is the direct, machineless conversion of the energy of fuel into electric power. The tech-

nical methods of applying this line have also been established. These are the magneto-hydrodynamic method and the method of fuel cells. The degree to which these methods have been elaborated so far is not sufficient to make them the leading lines of technical advance in the current five-year period. These years should witness the further scientific and technical elaboration of new methods which will make it possible to undertake the building of two or three large magneto-hydrodynamic electric stations after 1970. The efficiency of fuel consumption at these stations can be brought up to 50-60 per cent, which will yield a tremendous economy.

Control of thermonuclear reactions will cause a real revolution in the production of electric power. It will not only raise efficiency in extracting power from the primary energy resources, but will also replace the costly traditional types of fuel, reserves of which are shrinking, by practically inexhaustible energy resources.

Whatever trend is followed by scientific and technological research in radically changing the methods of power production, this change in itself is a decisive trend of technological progress in the power industry as dictated by society's economic needs.

The Soviet Engineering Industry

(Facts and Figures)

A. SHAPOROV, V. FOMICHEV, B. KOLBYAGIN

Ours is an epoch not only of radical social changes, but also of great technical discoveries

and inventions. In our day technology is one of the most important of society's productive forces, the basis of man's productive activity. The economy of the Soviet Union is being technically re-equipped on the basis of the priority development of heavy industry, engineering above all. In the modern production process the machine is the chief means of raising productivity and easing labour.

Accomplishment of the main technological tasks in the economy (electrification, chemicalisation, comprehensive mechanisation and automation) depends on the development level of the engineering industry. The volume of output of the engineering industry and its technical level largely determine the possibilities of reconstructing various sectors of the economy and developing society's productive forces.

Soviet engineering is now a comprehensive sector of industry that includes more than 100 independent specialised categories of production which manufacture tens of thousands of different machines, equipment and instruments. Engineering produces more than one-fourth of the total industrial output in the Soviet Union. It has one-third of the total industrial personnel, and about one-fifth of the fixed productive assets of all industry.

For growth rate engineering is one of the most rapidly developing sectors of Soviet industry. In the last seven years its output has increased by 140 per cent. During this period the average annual growth rate in this sector was almost 50 per cent higher than that of industry as a whole.

Under the new Five-Year Plan Soviet engineering will take another big stride forward. The plans for its development reflect the main tendencies of the contemporary scientific and technological revolution and outstanding discoveries in physics, chemistry, cybernetics and other sciences. Engineering plays a leading part in the further development of all social production, in raising its efficiency and in increasing the productivity of labour. In five years the total output of the engineering industry will increase by 60-70 per cent. The average annual growth rates in this sector will be 10-11 per cent, as compared with 8-8.4 per cent in industry as a whole.

MORE THAN A MILLION MACHINE TOOLS

The key problems of development in each sector of the engineering industry are defined in the Directives of the 23rd CPSU Congress.

While engineering is called the heart of industry, *machine-tool making* should rightly be regarded as the core of this sector. It is here that the material conditions are created for technological progress both of the engineering itself and of other industries. The machine-tool industry is one of the most effective "accelerators" of technological progress and labour productivity.

More than one million machine tools will be produced from 1966 to 1970. In the year 1970 there will be more than 3 million metal-cutting machine tools in operation. Alongside the further increase in output, quality will also be improved.

The productivity of the new models will be approximately 20-30 per cent higher.

Of prime importance is not only the mere increase in the park of machine tools, but a change in its structure and an increase in the proportion of the most advanced models.

In 1970, production of machine tools will reach 220,000-230,000 as compared with 185,000 in 1965. The most advanced models, especially high-precision, special purpose and multiple-unit, grinding and finishing machine tools will be increased at a faster rate than the others and the production of programme-controlled machine tools will rise steeply. Special attention will be paid to the manufacture of automatic machine tools and automatic transfer lines. This is one of the basic trends in engineering development in the next few years.

By the end of the Five-Year Plan, the production of metal-cutting machine tools will increase approximately 20 per cent as compared with 1965, and that of forging and pressing machines about 50 per cent to 50,000-52,000 units annually. By 1970, the ratio between metal-cutting and metal-stamping equipment will change in favour of the latter. In 1970, 22.6 forging and pressing machines will be produced for each 100 metal-cutting machine tools, instead of 18.6 in 1965.

800,000-kw TURBINES

The radical technological changes now under way in the power industry and electrification necessitate faster development of the *power machinery* and *electrical equipment industry*.

The output of steam, gas and hydraulic turbines (total capacity) will rise more than 50 per cent in five years. The proportion of large power units (boiler-turbine-generator) in the total output of condensing turbines of over 200,000 kw will increase. In 1970, their share will reach 85-90 per cent of the total. This will cut fuel consumption per kwh by about 11-14 per cent. The average turbine capacity will grow by 45 per cent in 1970.

The electrical equipment industry will also considerably increase the manufacture of generators for steam and hydroelectric stations.

The manufacture of 800,000-kw generators will be launched and the production of high-capacity units (200,000, 300,000 and 500,000 kw) will be extended, which will yield a big economic saving.

Complexes of electrical equipment (transformers, circuit breakers, converters, etc.) for transmitting 500 kV a.c. and 800 kV d.c. have been produced in the past seven years. In the current five-year period the manufacture of equipment for transmitting 1,500 kV d.c. will be organised. Successful solution of this problem will make it possible to transmit large quantities of electric power from Siberian stations to the European part of the country.

The manufacture of more economical power transformers is to be organised and the output of semi-conductor rectifiers will increase. Their use will save approximately 14,000 million kwh in 1970. Manufacture of a new series of small electric motors requiring much less material will be launched.

Electrical equipment plants will extend their range and will increase the production of various items for mechanising and automating production processes in industry and agriculture. They will supply more insulated wires of higher heat resistance, power cables designed for a tension of 500 kV, special communication cables, luminescent lamps, etc. The use of economical luminescent lamps, for example, will make it possible to save about 15,000 million kwh annually.

PRIORITY DEVELOPMENT OF CONVERTERS

The Five-Year Plan envisages the manufacture of improved, highly productive equipment for the *iron and steel industry*. Preference will be given to equipment for blast furnaces with a volume of 2,700 cu. metres. One such furnace produces two million tons of pig iron annually.

There will be changes in the production of equipment for the steel industry. Priority will be given to oxygen converters, and not to open-hearth furnaces. Until recently the biggest converter units were of 100 ton capacity, while now the manufacture of 250-ton converters is planned and 500-ton units are being designed. Experience shows that they produce metal which is not inferior in quality to open-hearth steel, while their productivity and performance indicators are much higher.

Production of rolling mill equipment will increase more than 70 per cent in five years. The manufacture of sheet and pipe rolling mills will

increase faster than others. Of great importance for improving the quality and assortment of rolled stock will be the new rolling mills for wide beams and pipes with a diameter up to 1,420 mm and also the equipment for rolling of precision and special shapes.

4,000-h.p. LOCOMOTIVES

Other sectors of engineering also have big tasks ahead of them. The *transport engineering industry* is called upon to complete in the main the replacement of steam traction by electric and diesel traction. Between 1966 and 1970, the production of main line diesel locomotives and goods wagons of greater capacity will increase. By 1970, diesel locomotives with a capacity of from 3,000 to 4,000 h.p. will make up 98 per cent of the total. The average carrying capacity of a wagon will be raised to 72 tons as compared with 63 tons at present.

The Soviet *automobile* industry will develop at a faster pace than hitherto. The production of automobiles in 1970 will increase by 140 per cent as compared with 1965 and amount to 1,360,000-1,510,000. The output of lorries will rise 50 per cent and motor cars nearly 300 per cent.

The output of big lorries with trailers and semi-trailers will be greatly increased. They will be able to transport a payload of up to 22 tons. Most of the new lorries will have a capacity of from 4 to 8 tons and 8- and 12-ton tip-lorries will be produced. The Byelorussian Auto Works has organised the serial manufacture of 27-ton tip-

lorries, and even more powerful machines are to be developed. The manufacture of lorries with a capacity of 65 tons and higher will also be organised. Delivery wagons to carry from 0.35 to 1.1 tons will be produced for the trading network.

Big changes will be made in motorcar production. The *Moskvich-408*, which meets modern requirements, will be produced in the next five years and a new, more powerful engine will be installed. The Zaporozhye Motor Works is manufacturing of a new model of the *Zaporozhets*. The capacity of its engine is up to 40 h.p.; the shape of the body will be changed, making the *Zaporozhets* a convenient and elegant motorcar. The *Volga* will also become more comfortable and economical. The new engine will considerably improve the dynamic properties of the car. The production of another model for personal use is also planned. It will be something in-between the *Moskvich* and the *Zaporozhets*. The output of urban, interurban and tourist buses will be nearly doubled in five years. Bigger and more comfortable buses designed for 120-140 and 190 passengers, instead of the present 60, will be produced. Taxis accommodating from 10 to 28 people, will be made for rural localities.

Hoisting and conveying machinery plays a big part in mechanising labour-intensive and arduous jobs. Until recently, the needs of these machines were far from fully satisfied. At present every fourth worker is engaged in conveying and loading and unloading jobs. The manufacture of machinery and equipment for the comprehensive mechanisation of hoisting, conveying and loading

and unloading work, of labour-intensive processes and warehouse operations is to be extended under the new Five-Year Plan.

The increasing scale of industrial and housing construction and also the development of the mining industry demand highly productive machinery, which will raise labour productivity in construction and mining.

The production of power shovels, scrapers, bulldozers and other earth-moving machinery will be increased, especially that of rotor and chain-bucket excavators with a continuous cycle. The average power of the engines of the machines and their productivity will be raised. This will enable the mining industry substantially to extend overburden removal work and thereby to raise the share of the more economical strip-mining of minerals. New possibilities will be available for reducing the cost of building and assembly work.

MORE PRECISION INSTRUMENTS

Instrument-making is of exceptional importance at the present stage of technological progress. The Directives of the 23rd CPSU Congress draw special attention to the need for a considerable growth in the output of instruments and automation devices, for the extension of their assortment and the improvement of their technical level.

The Soviet instrument-making industry registered considerable progress in the past seven years. The output of instruments and automation

devices rose by 160 per cent, with the production of computers increasing sixfold.

The manufacture of machines for centralised control, which process large streams of information and of universal computers and control machines based on semi-conductors, etc., has been organised.

Under the new Five-Year Plan the production of such instruments will be nearly doubled. The manufacture of electronic computers and control machines for the automation of calculations, accounting and bookkeeping will be notably increased. Overall, the output of computing machines in 1970 will rise by 260 per cent as compared with 1965.

MACHINERY FOR AGRICULTURE

The *tractor and farm machine industry* is called upon to ensure the further rapid growth of the technical facilities of agriculture.

The output of farm machinery is to rise approximately 70 per cent in 1970 as compared with 1965. From 1966 to 1970, tractor and farm machinery plants will produce practically as much machinery as was made during the preceding 10 years (1956-65). In 1970, the industry will manufacture 600,000-625,000 tractors and farm machinery worth 2,500 million roubles.

Main attention is now paid to supplying the collective and state farms with an improved range of machines for crop growing and animal husbandry. The industry now produces almost all the machines for the comprehensive mechanisation of the production of grain, sugar beet, potatoes, cotton and maize. In five years 487 new mo-

dels will be developed and their manufacture organised, including systems of machines for the cultivation and harvesting of flax, vegetables and other crops and also for the mechanisation of jobs in animal husbandry.

Tractors for ploughing at higher speeds with more powerful and economical engines will be produced. The average capacity of these engines will be raised to 85 h.p. in 1970 as against 59 h.p. in 1965. It is also planned to produce more progressive universal, wide-cut and multi-row machines, adapted to the natural economic zone of use and to the cultivated crops, and combined machines, which perform several operations. The production of tractor loaders and other equipment will be extended.

A large volume of irrigation and land reclamation work is to be carried out in the next five years. Many million hectares are to be drained and irrigated. Work on so big a scale can be accomplished only with the aid of special highly productive machines. A mole drain cutter for draining waterlogged land and a trench excavator for laying clay pipes are undergoing tests. Designers and engineers are working on the development of a rotary digging machine with a capacity of from 2,000 to 2,500 cu.m. per hour, complexes of continuous action, concrete pouring machines with a capacity ten times greater than usual, land levelling machines and other equipment. The output of pumps and other equipment will be extended. New systems of machines for the comprehensive mechanisation of land reclamation and irrigation work will be developed.

MACHINERY FOR THE LIGHT AND FOOD INDUSTRIES

Production of the light and food industries and also of household goods and articles meeting cultural requirements will greatly rise in the next five years. Greater production of equipment for the *light and food industries* will play a leading part in accomplishing this task. While in 1965 about 4,500 different machines and items of equipment were produced for these industries, as well as for the glass and printing industries, and for trading and public catering establishments, in 1970 this assortment will be doubled.

The output of modern equipment for the textile industry will rise nearly 100 per cent in five years; for the food industry, 50 per cent; and for trading and public catering establishments, 70 per cent.

The serial manufacture of up to 3,000 new models of highly productive machines will be organised for spinning, weaving and finishing factories, knit-goods, haberdashery and shoe factories, and enterprises of the food, meat and dairy industries.

A whole range of new machines is being developed for textile workers. Units for the mechanical loosening of cotton in bales which automate the arduous and dirty work of handling the fibre will be supplied. New carding machines will exceed the existing models in productivity. They will be fitted out with devices for automating auxiliary operations. Equipment for a fundamentally new, pneumatic method of spinning cotton (without spindles) will be developed. Shuttleless

looms of a new design noted for high speed will replace mechanical looms.

The manufacture of equipment for the knitgoods industry will grow at a fast pace and will practically double. The production of knitted fabric is 12-14 times faster than that of woven fabric, it requires 3 times less floorspace and 2 times less labour.

The improved quality and assortment of knitted fabrics largely depend on their finish, which requires a big range of dyeing and finishing equipment. In five years the output of such equipment will be trebled. Equipment will be developed for the full automation of finishing mills.

All sectors of the food industry will receive new highly productive and economical machinery. The level of overall mechanisation at bakeries will be raised from 60 to 95 per cent, for which purpose up to 100 types of flour milling and handling equipment are to be developed. New continuous-action beet-sugar diffusion installations and automatic lines for the production of packaged lump sugar will be introduced. The oil and fats industry will receive refining lines and automated equipment for the production of oleomargarine.

More machinery and equipment is to be supplied to factories producing household and other appliances. Their output will be raised and the demand will be more fully satisfied. In 1970, the industry will provide 7.5-8.0 million wireless sets and radiograms, 7.5-7.7 million TV sets, 5.3-5.6 million refrigerators, 1.0-1.1 million motorcycles and motor scooters. Soviet industry will launch the mass production of colour TV sets. The qua-

lity and finish of consumer durable goods will be improved, their reliability raised and service life lengthened.

THE ENGINEERING INDUSTRY AND TECHNOLOGICAL PROGRESS

Essential qualitative changes will occur in Soviet engineering industry in the next five years. The main technical parameters (capacity, speed, productivity) of machinery and equipment will be raised; the number of new models developed annually will increase. It is planned, for example, to produce units of greater capacity for the metallurgical industry, and installations for oil refineries with an annual throughput of 6 million tons instead of 2 million tons.

The higher technical level of machinery and equipment will make it possible to reduce capital investments, to raise the output-asset ratio and to reduce the inputs of materials and labour. Thus, calculations of turbine makers show that with the same expenditure of metal and labour it is possible to produce three turbines of 500,000 kw each instead of four turbines of 300,000 kw each. As a result, the country will receive an additional 300,000 kw of power capacity without any extra outlays. Here is another example: the capacity of the 2TE10L diesel locomotive is 50 per cent higher than of the TE-3, although their weight is the same.

The operation life of diesel engines of new design, which are to be produced in the next five years, will be longer by 50 to 200 per cent as compared with the existing diesels. Unit metal

consumption will be cut and consumption of fuel and lubricating oils will be reduced. In the next two or three years, Minsk tractor makers intend to raise the service life of their tractors prior to the first general overhaul from 3,000 to 5,000 hours and for some assemblies up to 6,000 hours.

Towards the end of the five-year period the technical and economic performance indicators of most of the goods made by the Soviet engineering industry will attain the level of the finest world models.

The introduction of progressive manufacturing methods in engineering will be greatly accelerated. This will improve the utilisation of raw and other materials and electric power and reduce the outlays of labour. Ultimately this will raise the productivity of social labour.

Such methods of processing as plastic deformation, precision casting, new methods of welding, electrophysical and electrochemical processes are being widely applied in engineering. All this ensures the most economical processing and high precision of the sizes of blanks and parts which frequently cannot be achieved by machining with metal-cutting tools.

A distinctive feature of electrophysical and electrochemical processes is their independence of the hardness and viscosity of the treated metal and the possibility of copying the form. The Directives of the 23rd CPSU Congress provide for the elaboration and introduction of highly efficient manufacturing processes—physical, chemical, electrophysical, electronic and others.

Standardisation of machine parts and assemblies is essential to raise the economic efficiency

of engineering. At present this work is limited as a rule to the establishment of the main technical parameters of machines (payload, capacity, speed) and the properties of materials, but does not concern the size and shape of parts, and does not affect questions of design. Owing to this, there are frequent cases when even machines of similar purpose are entirely different in design and their main parts and assemblies are not interchangeable.

The Directives of the 23rd Congress obligate machine makers to standardise assemblies and parts on a wider scale. This will make for an increase in the scale of production of parts, raise labour productivity and cut costs of operation and maintenance of the machine. Standardisation of assemblies and parts will make it possible to produce new modifications of machines with a minimum number of original parts, ensure their interchangeability, accelerate repairs and cheapen their costs, because it will be possible merely to replace the worn-out parts and entire sub-assemblies.

A number of specialised factories for the manufacture of machine assemblies and parts are to be built in the next five years and the centralised manufacture of iron and steel castings, forgings and stampings, welded sections and articles for general use in engineering (reduction gears, chains, fastenings, pumps, gears, rollers, etc.) at specialised factories is to be increased.

Fulfilment of the Five-Year Plan targets in the engineering industry will help accelerate technological progress and raise the economic efficiency of all social production.

Automation and the Management of the Economy

G. KAZANSKY, *First Deputy Minister, Radio Engineering Industry of the USSR*

Extensive use of electronic computers for the collection and processing of economic information in all links of the economy is an important requisite for successful economic growth today.

Until recently in the Soviet Union the main attention was concentrated on the manufacture and employment of electronic computers for scientific and engineering calculations, and also on special-purpose machines. The signal successes in space exploration, nuclear physics and other spheres of science and technology would have been impossible without electronic computers.

But the manufacture of machines for processing economic information, especially devices for the input of economic data and output of the results of solutions by the machines was done on a relatively small scale until recently. So far these devices have not been widely applied. Moreover, machines designed for economic computations are often utilised with inadequate efficiency.

Large-scale production of modern electronic transistor computers has now been organised. They can be used for both scientific and engineering calculations and also for processing of economic data. *Minsk-22* which enjoys a big demand is a case in point. It is relatively inexpen-

sive, reliable, has a high operating speed, an adequate capacity of internal and external memories and is equipped with alpha output printers making it possible to receive various economic documents directly from the machine in ready form—such as reports, applications, balance sheets, etc. *Minsk-22* can be conveniently used at large enterprises or in computation centres serving several enterprises.

The output of electronic computers will steadily grow. But the wide introduction of electronic computer techniques in the economy depends not only on the available machines and their technical level. The main problem is to prepare the economic processes themselves for transfer to automatic computation with the help of machines. This is an exceptionally laborious job and it requires a considerable reorganisation of the existing forms of planning and management and also a change in the existing documentation.

Usually the work of automating an economic process begins with drawing up a detailed description (algorithm). Then a programme for performing the given process with the help of a machine is drawn up.

The complexity of automating economic processes is due to their great diversity and interdependence. Moreover, to ensure the efficient application of electronic computers it is necessary to introduce machine computation of data in entire complexes of economic processes. Attempts to perform with electronic computers only separate stages of computation work do not produce a positive effect because the remaining amount of manual labour is too great.

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The Ministry of Radio Engineering of the USSR has already certain experience in applying electronic computers in various spheres. Special timetables of developing new technology are used in many large jobs, which makes it possible to plan more precisely and control the course of development work. Calculations of the material supply (summing up the reports and ascertaining the total requirements, etc.) are made in the Computation Centre of the Ministry. The Lvov Television Factory, jointly with the Cybernetics Institute of the Ukrainian Academy of Sciences, is completing the development of a comprehensive system for managing a factory. Numerous economic calculations are made at computation centres set up at some of our factories.

The Ministry has elaborated a design for a sectoral automated system of controlling factories in the radio engineering industry. This project provides for the setting up of a network of computation centres which serve groups of territorially contiguous enterprises. The computation centres are joined by communication channels to the factories and to the Computation Centre of the Ministry, the lynchpin in the sectoral management system.

In addition to sectoral and departmental automated management systems, a state network of computation centres will be set up in the Soviet Union for the collection and processing of economic information and for solving problems of national economic planning and management. Ac-

complishment of this task will advance economic management in the Soviet Union to a new, qualitatively higher level.

Several opinions have been expressed concerning the method of setting up such a state network of computation centres. The maximum variant calls for building at once a single state network of computation centres. It is to have a big capacity ensuring the collection and processing of economic information including that from Ministries and Departments, and also the solution of problems of optimum planning on a countrywide scale. Another variant, which may be called minimum, is based on an extension of the existing network of calculating machine stations of the Central Statistical Board of the USSR and equipping them with electronic computers.

Evidently, the most expedient is the golden mean, namely, to build an autonomous state network of computation centres, but one of limited capacity at first. This network must not replace the sectoral and departmental networks. At the beginning it must solve the most important national economic problems acting in co-ordination with the sectoral and departmental networks. These tasks, in our opinion, should include the processing of information for the State Supply Committee and its territorial administrations and for the Central Statistical Board and its territorial agencies. Computation work on assignments from Gosplan agencies, and the processing of information in the system of the USSR Public Health Ministry can also be regarded as among its primary tasks.

Automation of the collection and processing

of data on material supply and state statistics, and also plan calculations by sectors and economic areas will make it possible at the first stage of the operation of computation centres by the state network to solve problems necessary for the balanced development of the national economy and will help to achieve the precise and rhythmical operation of each enterprise. As for automating the work of national optimum planning and management of the country's entire economy, this task evidently will have to be accomplished at the second stage in developing the state network. The USSR Gosplan and the USSR Academy of Sciences will elaborate suitable econometric models and methods and prepare the necessary normative, statistical and other information. By that time the capacity of the state network will be considerably enlarged and it will be able to perform the necessary computations.

The new Five-Year Plan signifies another sweeping advance of the productive forces in the Soviet Union. It will be marked not only by the wide introduction of new methods in managing the economy, but also by the wide automation of management processes.

OBJECTIVE—PUBLIC WELFARE

The National Income and the Rising Standard of Living in the USSR

A. NOTKIN, *Master of Economics*

Soviet economic science and practical economic management are now faced with the task of shifting to optimum planning, i.e., the drawing up of plans capable of securing maximum results with minimum outlays. The road to the optimum plan lies through the drafting of scientifically substantiated variants of the most rational and effective use of material and manpower resources, and applying the most up-to-date scientific and technological achievements. An indispensable condition for optimum planning is to take the most careful account of the proposals made by the factory collectives and by the local, republican and central agencies and research institutions. The rapid development of electronic computer techniques has greatly extended the prospects of variant planning, and this, in turn, enhances the role of scientific forecasts as a ba-

sis of planned guidance and increases the significance of science, primarily of economics, in national economic planning. An optimum plan can be defined as the variant that ensures maximum increase in the physical volume of the national income with minimum expenditure for every one per cent of this increase, and with the optimum correlation between the growth of production and the rise in national living standards.

The achievement of such an optimum is the central idea underlying the Five-Year Plan for 1966-70.

THE GROWTH OF THE NATIONAL INCOME IN THE NEXT FIVE YEARS

The Five-Year Plan directs the efforts of the Soviet people towards accelerating the growth of the national income. With the average annual increment in the gross social product amounting to 7 per cent, the national income in 1966-70 will increase by an average of 6.6-7.1 per cent annually, compared with 6.4 per cent in the preceding five-year period (1961-65). Further progress in all branches of the national economy will provide the material basis for this accelerated growth of national income. The average annual growth rate of industrial output in the next five years will remain at a high level, amounting to 8-8.5 per cent. Primary importance is attached to the *development of agriculture*. Statistical estimates show that accelerated growth of agricultural output tends to reduce the share of material expenditure and increase the share of the net product

or national income in the gross social product. The increase in the national income is achieved both by more rapid growth of agriculture and by the rising share of the net product in gross agricultural output. A graphic confirmation of this is provided by the bumper-harvest years of 1958 and 1964, when the biggest gains were registered in the national income since 1950 (14,300 and 15,700 million roubles respectively). And conversely, during the bad harvest of 1963 this gain dropped to 6,800 million roubles. Between 1961 and 1965 the average annual growth of agricultural production was rather low, amounting to just 2.1 per cent and only slightly exceeding the rate of the population growth. In 1966-70 it is planned to increase the average annual farm output by 25 per cent compared with the preceding five years. This rise in agriculture is a decisive condition for accelerated growth of the national income.

Another cardinal condition is *higher economic efficiency of social production*. The growth rate of the national income (in physical volume) depends: with regard to manpower resources, on increased employment and higher labour productivity in material production. Next, with regard to material resources, it depends on increased fixed and circulating production assets, and on the dynamics of their utilisation, that is, on the rational use of the means of production.

The slow growth of the national income in 1961-65 was due not only to the lag in agriculture but also to the unfavourable changes in the economic efficiency of social production. This is illustrated above all by the following data on the

movement of the output-asset ratio in the national economy:

	1960	1961	1962	1963	1964	1965
Fixed production assets (including livestock) in all branches of the national economy	100	110	120	132	145	159
Newly created national income (in comparable prices)	100	107	113	117	128	136*
Changed output-asset ratio (2 : 1)	100	97	90	88	88	85

* In 1965, the proportion of the national income used for consumption and accumulation was 33 per cent above the 1960 level (in comparable prices).

The past five-year period was marked by a decline in the output-asset ratio in the entire sphere of material production, including industry and especially agriculture. This decline in itself does not yet mean a decrease in the economic efficiency of social production as a whole, for the latter also depends on the growth rate of *social labour productivity*. Periods marked by a decline in the output-asset ratio have occurred time and again in the history of large-scale machine production. But the rise in labour productivity resulting from additional expenditure of the means of production more than compensates for the extra outlays. The same thing happened in the USSR in 1961-65, when, despite a

15 per cent decline in the output-asset ratio, the increase in the newly created national income (in comparable prices) amounted to nearly 53,000 million roubles, with approximately 75 per cent of this gain resulting from higher labour productivity. However, had there been no decline in the output-asset ratio, the 1965 national income (in 1958 prices) would have been 30,000 million roubles greater. This essential difference could have been used to increase the public consumption fund.

The maximum increase in the national income can obviously be achieved by effecting a simultaneous rise in the output-asset ratio and in labour productivity. It is only natural that in outlining the basic trends of national economic development, the attention of the planning agencies was focused on the problem of determining the optimum correlation between the dynamics of the output-asset ratio and labour productivity. The Directives of the 23rd Party Congress on the Five-Year Plan emphasise the need for accelerating the growth of labour productivity by increasing the supply of electric power to industry and consistently intensifying all branches of production, to ensure bigger output and higher profitability per rouble of production assets.

Intensive research on the changed asset-output ratio over the past few years has enabled Soviet economic science to draw the conclusion that two opposite trends exist in our economy.

One of these trends is that large-scale concentration of the fixed assets in such asset-intensive branches as the power and fuel industries, ore-mining, iron and steel, agriculture and trans-

port tends to reduce the output-asset, ratio. The intensive development of these branches is necessitated both by the internal requirements of extended reproduction and by the requirements of the export to other socialist countries (this refers, in particular, to iron ore and oil). A number of asset-intensive branches in the next five years will be expanding at a faster rate than industry as a whole. While the latter's average annual growth rate will amount to 8-8.5 per cent, the increase in electric power output is planned to average 10.6-10.9 per cent and chemical output 14.9 per cent. Fixed production assets in agriculture will increase approximately twofold compared with the preceding five-year period, and the overall rise in farm output is to average 25 per cent. At the same time, the decline in the output-asset ratio caused by structural changes in the national economy is to be counterbalanced by the growing share of engineering and metalworking output in the gross social and industrial product. This branch is less asset-intensive and holds one of the first places as regards its relative weight in industrial production. Its output is expected to rise at an average rate of 9.9-11.2 per cent annually. As a result of these processes more than 50 per cent increase in overall fixed production assets will be attended by an approximately 40 per cent rise in the gross social product and national income. The decline in the output-asset ratio must be counterbalanced by utilising to the utmost the internal reserves of production.

Another very important factor in increasing the output-asset ratio is more rational and effective use of the means and instruments of la-

bour. There exist ample opportunities in Soviet industry for the more rapid commissioning of production capacities, for improving the use of equipment and extending the length of its service. According to current estimates, the reserves obtainable from the more intensive use of equipment amount to 19-20 per cent of existing capacity. Potentialities for more efficient use of machines are particularly great in agriculture. The Five-Year Plan calls for a reduction in the per unit consumption of rolled steel in machine-building and metalworking by approximately 20-25 per cent, of fuel in industry by at least 8-10 per cent, including fuel for generating electricity by 11-14 per cent, and electric power consumption by 6-8 per cent. The significance of this saving is twofold. Directly, it is a saving in circulating production assets, indirectly—also in the fixed assets in the most asset-intensive raw material, fuel and power branches, inasmuch as lower per unit consumption reduces the magnitude of the required expansion of these branches. It should also be borne in mind that every reduction of one per cent in material costs in industry will add 1,500 million roubles to the physical volume of the national income over the five-year period.

Industrial production constantly requires the discovery and exploitation of additional natural resources for replacing exhausted mines, wells and stands of timber, as well as for carrying on extended reproduction. Inasmuch as the development of new natural resources involves big outlays, it is expedient to expand production primarily by developing the economically more profitable deposits. The less profitable natural

resources must, as a rule, be developed only with the aid of the technical means that enhance their economic effect. Accordingly, the Five-Year Plan provides for priority development of the most economical natural resources.

The intensification of agriculture is expected to play an exceptionally big part in raising the output-asset ratio. Under the system of intensive farming investments in production assets perform two functions: they create the material conditions not only for saving manpower but also for the more rational use of the land and for a faster growth of agricultural output as compared with the preceding five years. This, in turn, will promote more favourable correlations between the growth of production assets and increased output throughout the economy. American experience proves that the asset-output ratio can decline both in industry and agriculture. The next five years will be marked by intensive accumulation of production assets in agriculture. It is important to ensure that they begin yielding practical effect as early as possible.

The achievement of a more favourable correlation between the dynamics of the output-asset ratio and labour productivity in the next five years with a view to obtaining maximum increase in the national income primarily depends on accelerated growth of labour productivity. Between 1966 and 1970 the average annual rate of growth of labour productivity per working person will rise to 5.9-6.2 per cent in industry as against 4.6 per cent in 1961-65, to 6.6 per cent in construction as against 5.3 per cent, and to 7-7.7 per cent in the socialised sector of agri-

culture as against 3.7 per cent.

A comparison of the rates of increase in labour productivity and in the volume of output shows that higher output per working person will account for most of the gain in gross industrial output, whereas in agriculture the rate of growth of labour productivity will outpace the output growth rate. Inasmuch as accelerated growth of labour productivity in the basic factor contributing to the rise in the national income, it must naturally be given particular attention in the new Five-Year Plan. The reference here is primarily to the intensification of technological progress in all branches of material production. The plan provides for the production of machines, appliances and equipment with better technical and economic indices, for the development and introduction in industry of highly effective technological processes—physico-chemical, electro-physical, electronic, etc. In the five years power consumption per industrial worker shall be increased 50 per cent.

Agriculture will be supplied with high-speed tractors, with up-to-date general-purpose, wide-cut and multi-row machines applicable in the various climatic regions, and with the most economical types of lorries with greater payloads and high cross-country capacity. A comprehensive land-improvement and irrigation programme will be carried out. Electrification of agricultural production will be substantially extended and mineral fertilisers applied on a much bigger scale.

A higher output-asset ratio and labour productivity depend not only on technological pro-

gress but also—to a very large extent—on rational organisation of the entire national economy and greater material incentives in the sphere of material production.

The proportions of material production are above all proportions in the development of the various industrial branches. Technological progress is effected mainly within each individual branch, depending on its technological peculiarities. That is why the transition to the branch principle of industrial management creates more favourable conditions for raising the economic efficiency of social production.

At the same time, higher efficiency is attained by the factory collectives—the immediate producers of material values. Hence, the enhancement of their material interest in production, along with the growing level of socialist consciousness, cannot but play an exceptionally important part in increasing both the output-asset ratio and labour productivity. A sizable part of the planned 20 per cent rise in average monthly wages of factory and office workers during the five years will be used to increase the minimum wage of those working in adruous or harmful conditions.

The planned increase of collective farmers' incomes in cash and kind by an average of 35-40 per cent must also stimulate bigger output and higher labour productivity in agriculture. In other words, higher incomes must primarily depend on the growth of output resulting from higher labour productivity. The raising of the material incentives to labour will ensure more rational and economical use of the means of

production, higher labour productivity and accelerated growth of the national income.

ACCUMULATION AND CONSUMPTION

The growth of the national income is a direct result of the development of production. At the same time, the newly created national income is a source of finance for further developing production and thus for satisfying the growing needs of the masses.

The expansion and perfection of production, technological progress and higher labour productivity are achieved mainly at the expense of the production accumulation fund, which forms part of the national income, and only partially at the expense of the depreciation fund.

The planned rise in the technical re-equipment of industry and in labour productivity requires big investments in fixed and circulating production assets. Capital investments in the development of industry, transport and communications during the five-year period will add up to approximately 152,000 million roubles, state and collective-farm investments in industrial building and the acquisition of machinery for agriculture to 71,000 million roubles. The total amount of capital invested in these key branches of material production will thus rise to 223,000 million roubles. The chief source of these investments is the growing production accumulation fund. A distinctive feature in the use of the national income and production accumulation fund during the next five years is the sub-

stantially bigger share of capital investments to be made in agriculture.

Much importance is attached to the problem of making the planned investments more effective. Accordingly, capital will first be invested for the completion of building already under way and of projects ready to be commissioned. Producer and consumer enterprises shall make agreements specifying more precisely the time limits for commissioning production capacities. For the same reason capital investments shall be directed first and foremost towards the technical re-equipment, greater specialisation and expansion of existing plants whenever this is economically more expedient than the building of new enterprises.

More rational use of investments and effective measures against slower growth of the output-asset ratio will increase production accumulation and ensure a faster rate of growth of national income with the minimum capital expenditure for each one per cent of increase in the national income. And this, in turn, will provide favourable conditions for the optimum combination of accumulation and consumption, which is a cardinal element of extended socialist reproduction.

The planned growth of the national income in the coming five years will ensure further development of material production and thus make it possible to effect a considerable rise in the people's standard of living and culture. With the national income increasing 38-41 per cent, the consumption fund will grow by 36-39 per cent and per capita real incomes by approxima-

tely 30 per cent. This means that the total share of productive and non-productive accumulation in the national income will rise insignificantly. The comparatively favourable correlation of the interests of reimbursement and accumulation, on the one hand, and consumption on the other, is illustrated by the following figures: while the total volume of capital investments in the national economy will increase 47 per cent over the five-year period, state and co-operative retail sales of consumer goods will rise by 40 per cent. A similar increase is planned in cash payments and benefits from the social consumption funds.

Between 1966 and 1970 labour productivity will increase more rapidly than the wages of workers engaged in material production. This will provide additional means for the further development of the entire non-productive sphere: science, education, public health and the arts, as well as for defence outlays.

Co-ordination of the interests of production development and popular consumption in the new Five-Year Plan rests on a definite natural-material structure of social production. Optimum correlation between production and consumption in every specific period presupposes definite proportions in the development of production of the means of production (Group A) and in the output of industries producing consumer goods (Group B), in industrial production of consumer goods and agricultural raw materials for their manufacture, etc. It is precisely these proportions that create the material prerequisites for technological progress, higher labour productivity and higher living standards.

Closer rates of development of Group A and Group B in industry were envisaged in the seven-year (1959-65) programme, but this correlation was not achieved. The relative growth coefficient in Group A stood at 1.6 in 1961-65, as against 1.2 in 1951-58. Only in 1965, when the output of Group A rose 8.7 per cent and of Group B 8.5 per cent, did there come a radical change, which is further consolidated in the new Five-Year Plan. Between 1966 and 1970 it is planned to increase the output of Group A by 49-52 per cent (at an annual average rate of 8.3-8.7 per cent) and of Group B by 43-46 per cent (at an average rate of 7.4-7.9 per cent annually), with Group A relative growth coefficient averaging 1.12-1.10. A close approximation of growth rates is thus evident. It relies on the operation of the following factors: first, the planned steep rise in agriculture, which plays the chief role in the raw material balance of Group B; second, more economical use of the means of production to cut down relative investment of capital per unit of output gain; third, increasing the share of sporting, recreational and household goods made of industrial raw materials as part of the output of consumer goods. While light and food industries output will increase about 40 per cent in the five-year period (or by an average of 7 per cent annually), the production of sporting, recreational and household goods is to rise 72-83 per cent (at an annual rate averaging 11.5-12.8 per cent). At the same time, the very possibility of bringing the output rate of Group A closer to that of Group B emerged as a result of achieving a high level of development in the output of producer

goods. This high level provides agriculture and Group B in industry with better instruments of labour than before.

The degree of the priority growth of production of means of production also depends on the structure of distribution of the means of production between Departments I and II. This is shown by the following data:

	1951—58	1959—64
Group A growth coefficient relative to Group B in industry	1.2	1.6
Average annual growth rate in the output of means of production in industry (Group A)	12.8	10.4
including:		
Department I	13.9	12.0
Department II	10.0	6.1
Ratio of growth rates of the output of means of production for Departments I and II	1.4	2.0
Correlation of capital investments in Group A and Group B	7.4	6.6

The planned approximation of the output growth rate of Group A to that of Group B in the next five years will be achieved by considerably increasing the output of most up-to-date equipment for diverse branches of the light and food industries, as well as for enterprises manufacturing sporting, recreational and household goods. It is planned to increase the output of machines for knitwear factories by at least 100 per cent, of dyeing and finishing equipment by 200 per cent and the production of equipment

for the food industry by 50 per cent (with the output of processed foods increasing approximately 40 per cent).

Some Soviet economists believe that the problem of raising the level of consumption is fully solved by the correct correlation of the rates of development of Group A and Group B. Actually, it is important to establish in the first place what correlation will ensure *maximum output* of consumer goods of the required assortment and quality. Approximation of the rates of development of Group A and Group B can best contribute to increased output of consumer goods only if it is achieved by bringing the rate of growth of Group B closer to that of Group A, not by sharply lowering the growth rate of Group A. The Five-Year Plan is based precisely on this trend of development. It provides for increasing the rate of output growth of Group B from 6.3 per cent in 1961-65 to 7.4-7.9 per cent, at the same time reducing the growth rate of Group A from 9.6 to 8.3-8.7 per cent respectively. This comparatively small reduction is fully compensated by the planned saving of the means of production, so that the rate of growth of the national income, far from declining, will actually increase.

Higher per capita consumption is to be achieved precisely through closer approximation of the growth rates of Group A and Group B, of industry and agriculture, chiefly by increasing the rates of growth of Group B and agriculture, improving the quality and making more economical use of the means of production. The consumption of meat and meat products, milk and dairy products, etc., will rise substantially in the

next five years. The output of motor cars will increase from 201,000 to 700,000-800,000 a year; of household refrigerators, from 1.7 million to 5.3-5.6 million; of TV sets, from 3.7 million to 7.5-7.7 million. Housing construction at the cost of the state and by building co-operatives will increase 30 per cent. All forms of communal and public services shall be further developed and improved.

The introduction of essential corrections in the distribution not only of the accumulation fund, but also in the consumption fund between town and country is a key feature of the new national economic plan. An almost twofold increase in the rate of growth of collective farmers' incomes in cash and kind as compared with the wages of industrial and office workers, along with the granting of pensions to collective farmers, lowering the prices of manufactured goods and foodstuffs sold in the rural areas, implementing a series of measures aimed at raising the cultural standard of the rural population—all this is exceptionally important for the solution of one of the main tasks of the new Five-Year Plan, namely, securing a steady rise in agricultural production. The envisaged sizable growth of the labour remuneration fund in agriculture will naturally make higher demands on the production and distribution of consumer goods and building materials, on the development of trade between town and country and the further expansion of the trading network in rural localities. The growing cash incomes of the rural population and the resultant higher demand for urban commodities (including articles

of cultural use) will accelerate the deruralization process in the countryside and create an effective system of material incentives for agricultural workers. Coupled with the development of production and technical contacts between industry and agriculture, this will promote the further rapprochement between town and country, which is one of the major social problems of communist construction in our country.

The use of the fast-growing national income for achieving an optimum combination of the interests of production development and the rapid advancement of the people's well-being is the central idea of the new Five-Year Plan. These interests are not mutually contradictory in principle. A rapid rise in living standards cannot be achieved without a steady development of production. And this development is effected in our country by many millions of people. The higher their material interest and socialist consciousness, the more intensively will the development proceed. The policy of advancing the people's living standards and providing more material incentives to labour, which is characteristic of the first phase of communism, finds its concrete embodiment in the planned growth of consumer goods output in industry, construction, and agriculture, and in the further expansion of the sphere of services. Without such concrete steps this policy would be devoid of all real content. At the same time, the policy of stimulating the development of production necessitates the allocation of a sizable part of the national income for the expansion of industries manufacturing producer goods.

As explained above, this expansion in industry is to proceed at somewhat higher rates than the growth of consumer goods output. In the national economy as a whole the output of industrial means of production will likewise grow at a faster rate than the gross social product and national income. The average annual gain in the output of industrial means of production will amount to 8.3-8.7 per cent, compared with 7 per cent in the gross social product. This is a law-governed process which furnishes one more practical confirmation of the correctness of the well-known Marxist proposition that in conditions of large-scale machine production developing at high rates, priority must be given to the growth of production of the means of production, whose quality and volume of output determine the level and scope of technological progress in the national economy as a whole.

The law of priority growth of the output of means of production is directly linked with the operation of the law of steadily rising labour productivity. Direct and indirect economy of manpower resulting from the use of machines, chemical plant and greater use of energy (primarily electrical energy) increases the aggregate amount of industrial means of production expended at all stages of social production relative to the total output of consumer goods in the entire national economy. As a result of this the output of industrial means of production grows at a faster rate than the gross social product. Herein lies the essence of the law of priority growth of the output of means of production, which expresses the need for constant economy of living

labour by the introduction of up-to-date equipment and advanced technology in production. The priority growth of the output of the means of production is accompanied by *economy* in the means of production on a national scale. But this economy is achieved through additional expenditure on the means of production, notably on special equipment. Although the saving usually exceeds the outlays involved, labour productivity, as a rule, increases more rapidly than economy on the means of production. Hence, the law of priority growth of the output of means of production also results in economy on the means of production; only the relative growth coefficient decreases.

Economy of living labour has been and remains the main factor in the growth of social production. It is achieved, first and foremost, through technological progress, through supplying industry with more fixed assets and electric power. According to available estimates, in order to raise labour productivity in Soviet industry by 33-35 per cent power consumption per industrial worker must be increased 50 per cent. The plan provides for a twofold increase in the consumption of electric power in agriculture during the five-year period, and for a 40-45 per cent increase in labour productivity at the collective and state farms. The attainment of these targets will require an additional priority growth of the output of industrial instruments of labour and, consequently, of all industrial means of production.

The Five-Year Plan goal of achieving a further rise in labour productivity as the main con-

dition for the growth of the entire economy is materially ensured by the priority growth of industries manufacturing means of production. The planned 49-52 per cent increase in their output will accelerate the growth of the national income, primarily through a more rapid increase in production assets and labour productivity. The growth of Department I will enable us to supply agriculture with increasing quantities of equipment, mineral fertilisers and building materials, and industrial Group B with equipment, building materials, chemicals and other raw materials. Such utilisation of the social product and national income will provide a reliable basis for putting into practice the underlying idea of the new Five-Year Plan—accelerated growth of the national income coupled with a steady rise in the standard of living of all Soviet people.

Accumulation and Consumption

B. PLYSHEVSKY, *Master of Economics*

The economic development programme of the USSR for the next five years, as approved by the 23rd CPSU Congress, is based on a strict scientific analysis of the interrelations of production, distribution, exchange and consumption at the present stage of communist construction.

The new Five-Year Plan sets out the task of making more effective use of the advantages of socialist relations of production for the further development of the productive forces to ensure

higher living standards for all Soviet people. This is shown most clearly in the accelerated growth of the national income. Between 1966 and 1970 it is planned to increase the volume of the national income used for accumulation and consumption by 38-41 per cent, or by an average of 6.7-7.1 per cent annually, as against 6.2 per cent in the seven-year period. What will be the source of this acceleration?

ACCELERATION FACTORS

The growth of the national income is determined by two factors: more employment in material production and higher labour productivity. Accelerated growth of the national income in the coming five years is based on both factors, but, as previously, *higher labour productivity will be of decisive importance.* The average annual rate of growth of labour productivity per worker will rise to 6 per cent in industry as against 4.6 per cent in 1961-65, to 6.6 per cent in construction as against 5.3 per cent, and to approximately 7 per cent in the socialised sector of agriculture as against 3.7 per cent.

At the same time, the new Five-Year Plan envisages a more rapid increase in the number of people engaged in material production. It is important to note that in the seven-year period the youth born during the war, which sharply reduced the rate of population growth, reached working age. In the coming five years young people born since the war when the rate of population growth was particularly high will reach

working age. The enlistment of a large number of new workers in social production will naturally increase the volume of the social product and the national income.

The number of workers will increase in all branches except agriculture, where it will decrease somewhat as a result of higher labour productivity. The labour force released from agriculture will be absorbed by industry and other branches. On the other hand, the enhanced system of material incentives coupled with improved cultural facilities and services will retard the economically unjustified outflux of the rural population to industrial centres.

The changed structure of the sectors of industry in which the national income is created reflects the industrial character of the process of socialist reproduction. Industry will make a bigger contribution to the national income, while the share of agriculture will somewhat decline. However, it should be pointed out that the causes of this phenomenon are quite different from those that applied during the Seven-Year Plan. At that time it was attributable in large measure to the slow rate of increase in agricultural production. In the next five years the situation will be changed radically by doubling the growth rate of farm production and thus bringing it much closer to the rate of industrial development. The fourfold gap that developed between industrial and agricultural growth rates in the past seven years will now be reduced by approximately one-half.

The share of the state sector in creating the social product will *rise markedly* in the next five

years as a result of more rapid growth of production at state enterprises and organisations as compared with the collective farms.

The increase in the national income created in the collective-farm sector is based predominantly on the development of the common enterprise. At the same time, the collective farmers' personal subsidiary husbandry will also play a conspicuous part. Yet the general tendency here will be towards consistently decreasing its relative share in the national income due to more rapid growth of production in the common enterprise.

PRODUCTION AND DISTRIBUTION

Continuous improvement of socialist distributive relations is a cardinal task of the Five-Year Plan. Its vital importance is determined by the entire preceding development of the Soviet economy.

The forms and methods of distributing the national income are not something arbitrary. They reflect the level of development of the productive forces and are subordinated to the solution of concrete economic tasks. For the same reason distributive relations cannot remain invariable. With the growth of the productive forces there arise new problems in the sphere of distribution. *Constant improvement of distributive relations is an indispensable condition for effecting a further powerful upswing of socialist production and raising its efficiency.*

The relations of creation and distribution of

the national income (prices, forms of labour remuneration, interrelations between enterprises and the state in the process of distribution and redistribution of the net social income) which existed until recently took shape chiefly in the early stages of socialist construction, when the national economy possessed comparatively small resources. The distribution of the national income at that time was entirely geared to the task of concentrating the bulk of the accumulation fund in the hands of the state with the aim of building up heavy industry and strengthening the country's defence potential.

A graphic illustration of this is provided by changes in the share of the national income redistributed through the state budget. Hardly reaching 25 per cent of the national income on the eve of industrialisation, it more than doubled in the prewar years. A large proportion of the national income was redistributed through the mechanism of prices and the financial system between agriculture and industry, between Departments I and II, between the collective-farm and state sectors.

The Soviet economy has made big strides since then. Compared with the prewar period, the volume of industrial production has grown nearly 8-fold, capital construction 9-fold, farm output 1.8-fold and the national income almost 6-fold. The economic level now attained permits us simultaneously to develop at high rates both production of the means of production and the output of consumer goods, thereby effecting a swift rise in national living standards.

Yet the forms of distributing the national in-

come remained practically unchanged. This found expression in the fact that *the formation of the accumulation and consumption funds was largely divorced from the introduction of genuine khozraschot in different branches and individual enterprises.*

The old system of production planning and assessing the economic activity of enterprises by gross output stimulated factories to fulfil their quantitative targets to the detriment of quality standards. It provided no stimulus for the rational use of production resources and not infrequently brought the interests of enterprises into conflict with those of society.

Non-conformity between the level of production development and the methods of distributing the national income was bound to reduce the efficiency of the socialist national economy. The experience of economic management has shown that the advantages of planned economy can be fully utilised only if the distributive relations are brought into conformity with the new tasks. The development of production, Engels emphasised, *"is stimulated to the utmost by a method of distribution which enables ALL members of society to develop and display their abilities to the fullest possible extent."*

The fundamental significance of the decisions adopted by the CPSU Central Committee at its Plenary Meetings in March and September 1965 consists in the elaboration of new methods of economic management corresponding to the requirements of the present stage of development. This imparted a distinctive feature to the new Five-Year Plan—a *close combination of the pro-*

gramme for the powerful development of the productive forces with the extensive use of the stimulating role of new distributive relations. And their improvement is expressed above all in changing the distribution of the national income between the accumulation and consumption funds.

NET INCOME AND ACCUMULATION

It is well known that under the old system of planning the initial distribution of the net income was inadequately co-ordinated with the actual contribution made by individual branches of industry, that is, with the results of the economic operation of enterprises. This found expression primarily in the sharp fluctuation of profitability in different branches and types of output. Furthermore, there was an excessively big redistribution of the surplus product through the mechanism of prices from Department I branches to Department II, and in the opposite direction through the national budget, which testified to the existence of serious non-conformities in the sphere of distribution resulting from the prevailing system of prices.

Profitability fluctuations are caused in the main by the emergence of disparities between existing prices and the cost of manufactured goods. Low prices prevented many enterprises from reimbursing their outlays, which naturally hampered even the creation of funds required for simple reproduction.

The initial distribution of the net income at sectoral level (profit, turnover tax) was inade-

quately co-ordinated with the need to form an accumulation fund, and often enough did not cover the requirements in capital investments and the growth of circulating assets. In a number of cases a sizable part of accumulations was unjustifiably withdrawn through increased contributions from profit to other purposes. Hence, finance from the budget was the chief source of the accumulation fund.

This situation weakened the influence of distributive relations on the development and perfection of socialist production. It did not induce enterprises to make more rational use of the fixed and circulating assets, improve labour organisation and raise quality standards.

The new Five-Year Plan introduces important changes in the sources of finance for the accumulation fund. The need for this is dictated not only by the planned growth of socialist production but also by the transition to the new methods of planning and economic management.

Henceforth the formation of the accumulation fund in all sectors of the national economy will directly depend on their own economic efficiency. Accordingly, the plan provides for *important changes in the proportions and forms of the initial distribution of the net income between different branches, and in their interrelations with the national budget in the course of formation of the accumulation fund.*

First, work is now in progress on fixing new wholesale prices of industrial goods and transport charges, which are designed to ensure profitable operation of all enterprises, raise their efficiency and economically justify the level of

production. The result will be a marked reduction in the scale of inter-sectoral redistribution of the surplus product per medium of prices, while the proportions in the initial distribution of the net income will be brought into closer conformity with the actual contribution made by individual branches to the creation of the national income.

Second, the system of distribution and the planned twofold increase in industrial profits will greatly enhance the role of the accumulations at the disposal of individual enterprises, which will be used to cover a substantial part of the outlays on modernising and reconstructing plant, to increase the amount of circulating assets, and to develop new types of output.

This will be attended by a change in the system of profitability planning. The amount of profit will no longer be based on actual production costs only, but will also depend on the cost of the fixed production and circulating assets placed at the disposal of the enterprises. This will promote more rational and economical use of the means of production, ensure more effective planning of capital investments and more efficient operation of production capacities.

Third, payment for assets as a new form of distributing the net income will have a similar effect. Its introduction means that, side by side with the reproduction of manpower and circulating assets, *khozraschot* relations will now include the movement and use of the fixed production assets. Through these contributions the enterprises will participate in the formation of resources for centralised capital investments.

Some economists are apprehensive that the new system of profitability planning and the introduction of payment for assets will retard technological progress. One can hardly share this point of view. Quite the contrary, these measures extend the possibility of applying most efficient technology. Far from obstructing technological progress, they bar the way to the use of low-productive equipment. From the economic point of view, new technology does not mean any particular new machine but only equipment which brings down the social cost of production.

Fourth, long-term credits are to play a bigger role in the formation of capital. Enterprises are now able to draw on this source whenever their own resources are insufficient to meet their financial requirements. The sphere of subsidising from the budget is being narrowed down, which will enhance the importance of *khozraschot* in distributing capital investments between different branches and enterprises.

Financing from the budget as a source of capital will be used mainly for establishing new branches of industry and building industrial complexes. Consequently, the state budget will form that part of the capital accumulation fund which plays the decisive role in altering the national economic proportions according to plan.

Important changes are also planned in *distributive relations between the state and collective-farm sectors.* The rise in collective-farm incomes during the seven-year period was largely attributable to the introduction of higher purchasing prices of many farm products and to a cer-

tain reduction in the sale price of machinery, equipment and materials.

Henceforth the size of collective-farm incomes will chiefly depend on the development of production, higher labour productivity and lower outlays per unit of output. Parallel with this, state assistance to agriculture will increase substantially. In conformity with the 23rd CPSU Congress Directives, state centralised investments in agriculture will amount to 41,000 million roubles in 1966-70.

All these measures will accelerate the development of agriculture and industry, bring much closer the rates of growth of Departments I and II, and increase the share of the most promising and economical branches, thereby ensuring rapid progress of the socialist economy and improving its basic proportions.

REAL INCOMES AND CONSUMPTION

The achievement of economically justified correlations between the growth of the national income and the consumption fund is the main objective of planning.

As distinct from the preceding period, which was marked by the growing relative weight of the capital accumulation fund, the rates of economic development fixed for 1966-70 are to be achieved while its share in the national income remains stable. Higher efficiency of social production is the most important prerequisite for this. And the growth of the national income will permit a considerable increase in the consump-

tion fund. Compared with the preceding five years, its volume will grow by 36-39 per cent, or approximately by as much as the national income.

This will provide the basis for an accelerated rise in the standard of living. The five-year programme provides for a substantial increase in the real incomes of the population. Per capita real incomes will rise 30 per cent and their rate of growth will be 50 per cent higher that in 1959-65.

The people's material well-being is determined not only by the size of their cash incomes but also by the extent of their provision with commodities and services. That is why the five-year programme attaches paramount importance to accelerated development of the manufacture of consumer goods. *This will provide the basis for achieving an economically substantiated correlation between the effective demand of the population and the supply of commodities and services.* The average annual increase in the output of industrial consumer goods over the five-year period is fixed at 7.4-7.9 per cent as against 6.8 per cent in 1959-65. The services will increase by 150 per cent.

The Five-Year Plan calls for the further improvement of the socialist principle of distribution according to the amount and quality of work. More extensive application of progressive and stimulating forms of labour remuneration, which will undoubtedly diminish the difference still existing between the income level of various groups of employees, is directed precisely towards this end. It also determines the basic

changes in distributing the part of the national income that goes for personal consumption.

The 23rd CPSU Congress Directives provide for an increase in the wages of factory and office workers by an average of at least 20 per cent between 1966 and 1970, and in collective farmers' incomes by an average of 35-40 per cent. Higher cash incomes will be ensured by raising wages, improving the system of labour remuneration and increasing the amount of bonuses from the material incentive funds.

In the current five years *bonuses to factory and office workers shall be introduced in all branches of the national economy.* The size of bonuses will directly depend on the results of operation of every enterprise, and on the fulfilment of targets fixed for the volume of sales and profits. This will considerably increase the share of bonuses in the earnings of factory and office workers, on the one hand, and improve the correlation between the growth of cash incomes and of labour productivity, on the other.

The correlation between the labour remuneration fund and the public consumption funds will likewise change. The role of sources directly connected with the labour performance of each individual worker in personal incomes will be much greater than in the preceding period.

The rising purchasing power of the population will increase the demand for high-quality foodstuffs, manufactured goods and various services. *The formation of the consumption fund now increasingly depends on a proper estimate of social requirements and of changes in the effective demand of the population.*

The Five-Year Plan targets for the growth of the national income are not the limit. Their overfulfilment by just one per cent will give the country an additional 2,600-2,700 million roubles and increase the public consumption fund by nearly 2,000 million roubles. The further progress of the socialist economy and the achievement of higher living standards will entirely depend on the labour enthusiasm and initiative of the working masses themselves.

Employment and Manpower Resources

P. LITVYAKOV, *Master of Economics*

In the current five years the scope of Soviet economic development will be greatly expanded. New industrial projects will be built in all parts of the country and many existing enterprises will be substantially enlarged. They will naturally require many additional working hands. The replenishment of manpower in the USSR is ensured by the more effective use of labour resources.

The 23rd CPSU Congress Directives set the task of making more rational use of labour resources. The distribution of manpower among different industries and economic areas is aimed at securing high rates of economic development, maximum satisfaction of the people's material and cultural requirements with minimum expenditure of labour, and full employment of the able-bodied population.

FULL EMPLOYMENT

A steady increase in the number of persons employed in the social economy at a rate exceeding natural growth rate of the able-bodied population is a characteristic feature of the Soviet economy. Between 1958 and 1965 the number of persons engaged in the national economy and education increased from 77 to 87 per cent.

The numerical growth of manpower is accompanied by substantial improvement in the technical equipment of labour. A graphic illustration of this is provided by the following figures: during the eight years 1958-65 the fixed assets per worker in industry increased by 70 per cent and the output of electric power by approximately 60 per cent. *Thus, full employment of the able-bodied population in the USSR is combined with a steady rise in the technical level of production.*

The possibility of creating and maintaining conditions ensuring full employment testifies to the viability and dynamic character of socialist society.

Bourgeois scientists claim that technological progress inevitably gives rise to so-called structural unemployment which, being an indispensable condition of economic development, should not be regarded as true unemployment. However, the spurious "structural unemployment" theory is effectively refuted by the facts of economic development in the socialist countries. High and stable rates of development of the socialist economy, its planned character ensure the necessary increase in new jobs.

* * *

The rates of economic development are directly linked with the magnitude and pattern of accumulations. In the past two decades the share of accumulations in the national income exceeded 25 per cent, with over two-thirds of all capital investments going for the creation of fixed production assets. This figure is two and a half times the corresponding US index.

With the planned 38-41 per cent growth of the national income over the five-year period, total capital investments will rise by 47 per cent above those for the preceding five years, as a result of which fixed production assets will increase by more than 50 per cent, including 60 per cent in industry and 90 per cent in agriculture. This will be accompanied by an increase in the share of the resources allocated for the formation of the active part of the fixed production assets such as plant and machinery. More rapid technical re-equipment of all branches of production, and progressive modification of its structure, is a distinctive feature of the new Five-Year Plan. The cost of a new job in industry is increasing all the time.

About 40 per cent of all industrial workers are employed in the chemical, power, engineering and metallurgical industries. Much bigger investment is needed to create a new job in these branches than, say, in the light or food industry. Compared with the latter, the chemical industry requires two to three times, the iron and steel industry three to four times and the power industry five to six times more capital investments

per worker. But the development of these branches, which ensure the technological progress of the national economy as a whole, demands specific prerequisites for high employment and efficient use of the available labour resources. On the basis of the planned growth of social production, the development of science and the extension of the range of services, the number of new jobs will continue to increase at a rate considerably exceeding the natural growth rate of the labour force. Hence the number of factory and office workers in the national economy will amount to 91-92 million by 1970, as against 76.9 million in 1965.

In the current five years the youth born in the fifties, when the rate of population growth was fairly high, will reach working age. But they need not fear unemployment, for the number of new jobs will be increasing by an average of 3 million annually, which considerably exceeds the number of young people offring their services.

Inadequate scientific substantiation of economic plans in the past adversely affected the use of manpower. For one thing, the differing standards of living in various economic areas caused migration of labour, which does not always correspond to the interests of society. This found expression in the excessive outflow, especially of young people, from the rural areas to the cities. As a result, agriculture in a number of areas now has to contend with serious difficulties caused by the shortage of skilled machine operators, field-crop and livestock experts. Excessive migration from the country to the town was largely attributable to inadequate application of the ma-

terial incentive principle in the collective and state farms, as well as to the insufficient provision of cultural facilities and services. Although wages on some collective farms are no lower than in industry, a part of the rural youth continue to flock to the towns. The Five-Year-Plan Directives set the task of considerably extending the scale of construction of cultural facilities and public-service establishments in the countryside, which will make for more effective utilisation of manpower resources.

In order to provide favourable living and working conditions for the people, and to establish permanent contingents of workers in the eastern and northern areas, which experience a shortage of manpower, capital investments for the construction of dwellings, schools, hospitals, cultural institutions, etc., in these areas will be higher than in the European part of the USSR. The territorial wage rates will also be raised.

DISTRIBUTION OF MANPOWER

Effective use of manpower depends on the improvement of the national economic proportions. One of the basic proportions in the pattern of employment is the distribution of manpower between material production and the non-productive sphere.

In determining the correlation between productive and non-productive employment, due account must be given to the necessary economic growth rates and the available potential labour resources. The expansion of the non-productive

sphere requires relatively less capital investment for each new job, thus providing jobs for more people with the same capital investments. However, any unjustified increase in capital investments in the non-productive sphere subsequently reduces the rate of economic development, which will ultimately tell on the efficiency of the labour force. The present ratio is 25 persons in the non-productive sphere per 100 workers engaged in material production. *The numbers employed in the non-productive sphere will increase substantially in the current five years.* The growth of employment in education and public health will proceed at high rates. This is necessitated by a considerable extension of the network of kindergartens and nurseries, and by the introduction, during the five-year period, of universal secondary education for the youth. Particularly big increases are planned in the number of workers employed in communal and public-service enterprises. By 1970 the volume of services available to the public will increase by about 150 per cent.

The efficient use of manpower in material production is also affected by the ratio of employment in industry and agriculture. The constant increase in the number of industrial workers is accompanied by a reduction in agricultural employment. The latter now accounts for approximately one-third of the national labour force, compared with 54 per cent in 1940.

About two-thirds of the country's requirements in additional manpower were supplied by the rural population in recent years. In 1966-70 the role of this source will somewhat diminish

owing to the bigger natural increase in the available labour. The release of manpower from agriculture will proceed more slowly than during the preceding period, chiefly as a result of the planned growth of farm output, and of further improvement of conditions in the countryside.

It is important to stress, however, that *in the current five-year period the number of workers in industry must be higher than in agriculture.*

A considerable proportion of the national labour force (approximately 13 per cent of the able-bodied population) is still engaged in domestic work and personal subsidiary husbandry. A definite part of this potential labour force will be gradually drawn into social production.

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Rational use of manpower resources largely depends on the proper territorial distribution of production. Socialist society is interested not only in the immediate economic effect yielded by the rational distribution of production. By developing social production the state systematically guides social processes. The new Five-Year Plan, for example, proceeds from the need of levelling out the standard of living in different parts of the country, of further erasing the basic distinctions between town and country, and between mental and physical labour. The problems of manpower utilisation were decided by a thorough analysis of the economic, social and demographic factors.

A characteristic feature of the current five-

year period is the building of factories in densely-populated areas, mainly in small and medium towns (with a population not exceeding 100,000) possessing large reserves of manpower. The reference is primarily to women engaged in household work, who account for approximately 12 per cent of the labour force in the rural communities. It should be pointed out, however, that in small towns the proportion is considerably higher.

One of the chief causes responsible for the uneven distribution of manpower resources was the unjustified economic policy of locating new enterprises predominantly in big cities. Under the seven-year programme between 60 and 90 per cent of capital investments were directed to republican and regional centres, with the result that the population of many small and medium towns declined or increased only slightly. On the other hand, it rose by approximately one-third in towns having 100,000 or more inhabitants, which now account for more than half of the country's total urban population. This tendency hampers the solution of many important socio-economic tasks.

With a view to ensuring more extensive enlistment of new contingents of manpower in social production, and smoothing away the territorial differences still existing in the standard of living, the 23rd CPSU Congress Directives provide for a more equal distribution of industry. Labour-consuming branches, local industries and art handicrafts will be developed in small and medium towns. Industrial development in the big cities is to be confined chiefly to

the reconstruction of existing plants and the building of new enterprises to serve public needs.

A number of economic areas in the USSR are notable for their historically evolved pattern of production based on the predominance of either male or female labour (mining, ferrous and non-ferrous metallurgy, heavy engineering, textile industry, etc). Particular attention is given in the Directives to the comprehensive economic development of these areas, which will facilitate more effective use of the labour force.

Considering that the manpower available on the state and collective farms is not being fully used throughout the year because of the seasonal nature of farming, the new five-year programme finds it expedient to develop ancillary enterprises for the processing of farm produce and the manufacture of other products (wood and ceramic articles, lace, shawls, etc.) as well as to set up building and repair shops in rural localities.

AT EVERY ENTERPRISE

Effective use of manpower also depends on its rational employment in factories, institutions and organisations. This is reflected above all in the growth of labour productivity. This depends on the relationship between workers and the engineering and technical personnel, between skilled and unskilled labour, on the technical equipment of labour, on the degree of profession-

al skill of the personnel and on the rational use of working time.

A large number of well-trained engineers and technicians came to work in Soviet industry in recent years. The operation of our technical and technological services has markedly improved. But the proportion of engineers and technicians without specialised education is still high, especially at the new enterprises built in the eastern areas. Seventy-five per cent of our economists and planners have no special education. In a number of cases the engineering and technical personnel do not perform their proper functions and spend much time on purely technical and office work.

Modern conditions and the tasks of economic development confront the managerial personnel with new challenges, obliging them to master methods of economic guidance, apply the latest methods in management, use up-to-date computing techniques and seek to cut down the number of office personnel.

In the current five years 840,000 economists with higher and secondary educational qualifications will be trained. The economic training of engineers and technicians will be improved.

Nearly 50 per cent of all workers in industry and over 60 per cent in construction are still engaged in manual labour. The degree of mechanisation of auxiliary operations is considerably lower than that of basic production. *Mechanisation of auxiliary operations is now one of the main conditions for more effective and rational use of the labour force.* The enhanced economic initiative of enterprises opens up broad oppor-

tunities for the constant improvement of production on the basis of new technology. It will accelerate qualitative changes in the character and content of labour, in workers' functions, in the use of manpower.

Implementation of the planned economic development measures will considerably improve the use of manpower resources and substantially raise the productivity of social labour.

In the five-year period the average annual rate of growth of labour productivity per working person will amount to 6 per cent in industry as against 4.6 per cent in 1961-65, to 6.6 per cent in construction as against 5.3 per cent, and to approximately 7 per cent in agriculture as against 3.7 per cent. Not less than three-quarters of the total increase in industrial output over the five-year period must be obtained through higher labour productivity, compared with less than two-thirds in the preceding five years.

The proportion of persons engaged in the social economy and in education is expected to exceed 90 per cent of the national labour force by 1970.

Under socialism there is no objective basis for the emergence of a redundant able-bodied population.

EXTERNAL ECONOMIC RELATIONS OF THE SOVIET UNION

Co-operation between the Socialist Countries

O. BOGOMOLOV, *Master of Science*

The 23rd CPSU Congress devoted much attention to problems of co-ordinating the economic development of the socialist countries, of enhancing the economic might and cohesion of the world socialist system. Relations between these countries, the Congress noted, have reached a higher level as a result of broader bilateral and multilateral economic, scientific and technical co-operation. At the same time, much still remains to be done to utilise more fully and effectively the advantages of socialism as a world system.

This greatly increases the role and responsibility of economic theory which, the Congress stressed, must blaze the way for practice. "Economists," Leonid Brezhnev said at the Congress, "are now busy working on problems of greater specialisation and co-operation in production and the more rational dovetailing of national

economic plans." Like many Fraternal Parties, the CPSU is of the opinion that only in this way can the national economies of the socialist countries keep pace with the tempestuous scientific and technological revolution of our day and thus ensure conditions for further advances in the economic competition with capitalism.

FRUITFUL RESULTS AND NEW PROSPECTS

The economic progress of many socialist states is now closely dependent upon the more extensive international division of labour, which is imperatively demanded by the vital interests of all socialist countries, whether big or small, industrially developed or in the process of industrialisation. "The division of labour between the socialist countries," A. N. Kosygin stressed in his report on the Directives for the Five-Year Economic Development Plan of the USSR for 1966-70, "plays an increasing role in supplying their economies with equipment and raw materials, and in increasing the supply of consumer goods. It helps them to accelerate technological progress and to raise the efficiency of social production. The international socialist division of labour, practised on voluntary lines on the basis of full equality, is helping us, and our friends—the fraternal socialist countries—to advance more rapidly towards our common goal, communism."

There is abundant evidence to show that the joint efforts undertaken by the member-states of the Council for Mutual Economic Assistance

(CMEA) in the past few years have yielded good results. Oil is a good example. A major part in the development of the oil industry belongs to the world's biggest *Friendship* Pipeline, which carries Soviet oil to the fast-growing industries of the GDR, Poland, Gzechoslovakia and Hungary. Another example is the *Peace* Power Grid with a central control board in Prague, which enables the socialist countries to make optimum use of their energy resources and to economise on new investments in power development. International co-operation within CMEA helps to supply the European socialist countries with deficit raw materials and primary products. More jointly financed enterprises for the mining of scarce raw materials and fuel are being built in the socialist countries.

New prospects are opening up before specialisation and co-operation of production. The CMEA-approved recommendations in this field cover a wide range of machines and equipment. Since 1958 recommendations have been approved on production specialisation in 37 groups of engineering products and precision instruments, embracing 1,700 standard sizes and technological lines. Most of these recommendations were adopted since 1962.

It is highly significant that of late there have emerged new, more progressive forms of socialist co-operation, such as the International Bank of Economic Co-operation, which carries out multilateral settlements, the CMEA car pool for rationalising rail freight carriage, organisations for co-operation in the production of ball-bearings and rolled goods, which have been func-

tioning since 1964. These are international associations of producers set up by CMEA countries on a voluntary basis for joint management. Their function is to promote direct co-operation between large enterprises manufacturing similar types of products. It is planned to set up such organisations in the chemical industry (*Interchemistry*) and in a number of branches of engineering.

Some of the European socialist countries took the path of organising (so far mostly on a bilateral basis) joint enterprises, designing bureaus and industrial amalgamations. For example, *Haldex*, a joint-stock company founded by Hungary and Poland to process mine-slag, has been operating successfully for several years now. In 1965, Bulgaria and Hungary set up a bilateral organisation, *Intransmash,* which will serve as the general design centre and supplier of equipment for intra-plant transport, open-cast mining, etc. Another Bulgaro-Hungarian joint undertaking, *Agromash*, co-ordinates production of farm machinery. The five-year (1966-70) agreement on co-operation in the automobile and tractor industry, concluded by Hungary and Poland in 1965, provides for production specialisation between the two countries and for reciprocal deliveries of parts and units required for the production of buses and lorries. A joint committee has been formed to supervise the implementation of the agreement. Joint industries of this type are being set up by other CMEA members.

That socialist economic co-operation is developing successfully is also indicated by the

growing volume of trade between CMEA countries. Reciprocal trade between them now accounts for 65 per cent of the total volume. Between 1951 and 1964 the aggregate value of commodities exchanged by these countries increased 350 per cent and exceeded 11,000 million roubles.

The world socialist market is the chief source of supplying the fraternal countries with most of the products essential for their economic development. It also enables them to market their output, including goods made by newly established industries, which are as yet unable to compete with similar products on the capitalist market. The socialist market with its commodity-money relations is beginning to influence the growth of the international socialist division of labour much more actively than before.

Much economic benefit is also derived from scientific and technical co-operation. It helps to introduce and to disseminate advanced technical experience and the latest engineering achievements in all CMEA countries, thereby helping to even out the varying levels of industrial development in different countries. More recently scientific and technical co-operation has been extended to another important field—accelerating and lowering the cost of research by uniting and co-ordinating the efforts of scientists from the various socialist countries. The CMEA members now have a unified long-range plan for co-ordinating scientific and technical research in many fields.

The complex mechanism for co-ordination of

national economic plans and for international specialisation and co-operation in production has been set in motion. This is a noteworthy development, for international economic relations of this type have no precedent in history. But it stands to reason that this new mechanism cannot be expected to function without any hitch. Practical experience has shown that the task of effectively applying socialist economic management on an international scale is anything but easy, for it involves co-ordination of the views of the countries concerned and correct combination of their national interests (allowing for the specific features of their socialist construction, the level of their industrial development and of their people's living standards) with the common interests of the entire socialist community.

THE PROBLEM OF RAW MATERIALS

One of the cardinal problems of the division of labour between CMEA nations is that of eliminating the gap between their rapidly growing requirements in basic raw materials and fuel and the possibility of meeting these requirements.

The acuteness of this problem is explained not only by inadequate fuel and raw material resources in a number of European socialist countries or by the relatively high expenditure of raw materials. It is largely due to the operation of adverse economic factors, notably the big capital investment required by the mining and processing industries, and to inefficient methods

of planning and stimulating the growth of these branches. Yet the demand for raw materials is steadily growing, while the range of countries supplying the socialist market with primary products is diminishing. The Soviet Union is the biggest exporter of fuel and raw materials to CMEA countries. In the process of co-ordinating the economic development plans of the CMEA countries for 1966-70, the Soviet Union undertook to meet practically all their requirements in fuel and raw materials. In its efforts to accelerate the progress of the fraternal socialist states, the USSR is at times even prepared to forego its own interests.

And after 1970 also the European socialist countries will have to increase their fuel and raw material imports. How to meet this rising demand is a complex problem, for it will require of the exporting countries huge additional long-term investments, and this is bound to restrict their opportunity to invest in more economical and profitable industries yielding quick returns.

As time goes on the exporting countries will find it more and more difficult to meet the growing raw-material requirements of many CMEA members. This problem is a very serious one. It involves large-scale deliveries to a group of countries aggregating nearly 40 per cent of the Soviet Union's industrial potential. Suffice it to say that in 1964 the European socialist countries belonging to CMEA (exclusive of the USSR) imported approximately 21 million tons of coal, 22 million tons of iron ore, 14 million tons of oil, 2.3 million cubic metres of sawn timber and quantities of other raw materials.

Considering the vast scale of deliveries involved, it should be clear that the solution of the raw-material problem along the lines of socialist co-operation cannot be achieved by conventional methods of trade. It requires the closest co-ordination of economic development beneficial to all of the co-operating countries. The CMEA members are unanimous in their opinion that the key to the solution of this many-sided problem should be sought primarily in rational combination of the economic interests of each individual country with those of the entire socialist community.

A close study of the raw-material situation has shown the urgent need of elaborating the theoretical problems of the efficiency of the international socialist division of labour, and the methods of measuring it. Moreover, in devising ways and means of solving the raw-material problem the CMEA countries felt it necessary to focus attention on improving the mechanism of commodity relations in the world socialist market (including export and import prices), on developing the socialist principles of bilateral and multilateral international settlements.

SPECIALISATION AND MORE EFFICIENT ECONOMIC PLANNING

Specialisation and co-operation in production is the most progressive form of international socialist division of labour. Despite the indisputable achievements in this field, the present level of production specialisation between CMEA

members is still far behind the requirements of the developing scientific and technical revolution and the rapidly increasing productivity of labour. In 1964, the share of specialised products in the total output of CMEA countries amounted roughly to 6 per cent, and in their exports to 14 per cent.

It is generally agreed that specialisation means the establishment of closer links between diverse industries of the various countries, which are accompanied by changes in the structure and qualitative level of production. But different views are expressed as to methods of combining international specialisation in production with the comprehensive development of the national economy. Certain economists believe, for example, that it is impossible to extend international specialisation to whole branches of production, that comprehensive economic development can be achieved only by effecting intersectoral specialisation limited to specific industries, production groups, complete sets of equipment, their parts and units.

On the other hand, it is proposed that specialisation should be treated more broadly, that co-ordination of national economic plans must be regarded as the first stage of production specialisation. According to this point of view, the industrial products covered by co-ordinated plans are specialised because they are delivered on the basis of inter-state ties that are much closer and more reliable than purely commercial relations. Such interpretation tends to include in specialisation not only relations within a definite branch of industry, but also close and

stable relations between different departments of the states participating in plan co-ordination.

While sharing in the efforts to extend international production specialisation, the CMEA countries naturally seek to co-ordinate it most effectively with their national economic tasks of industrialisation and with a higher level of economic development, full employment balance of payments equilibrium, etc.

The establishment of close economic co-operation between CMEA countries is largely determined by more effective bilateral and multilateral co-ordination of long-term national economic plans, which still remains and will long remain an effective instrument of rational division of labour. The leading role of plan co-ordination in the promotion of closer co-operation is explained by the fact that the state plan in these countries is the chief lever of economic management, of distribution of capital investments and of basic material resources. Major changes in the sectoral structure of production or in the distribution of manufactured goods to deepen international specialisation can be effected only after they are included in the respective national plans. Hence, progress in the division of labour is inconceivable without co-ordination by the planning agencies of the socialist states.

It is becoming increasingly clear that effective co-ordination will require much more effort and time than was originally assumed. It will be necessary to clarify many new theoretical questions and to create a number of important methodological and organisational prerequisites.

The operation of economic laws of socialism on an international scale differs from the way they act within one country. This is only natural, for relations between sovereign socialist states, between national economic systems and their organs differ in structure from the economic relations between the various links of any national economic system. The CMEA experience in the field of plan co-ordination must be generalised and theoretically analysed. It will furnish abundant material for far-reaching scientific conclusions, notably the fundamental conclusion that plan co-ordination is not mandatory in character, that no "general plan" can be imposed on any socialist country from above by one or another supranational body. Voluntary agreement of all countries concerned, their common economic and political interest in close co-operation is a reliable guarantee that the recommendations adopted by the Council will be successfully applied.

The efficacy of plan co-ordination is directly linked to new methods of planning and economic management now being introduced in most of the CMEA countries. By raising planned economic leadership to a qualitatively higher level the economic reforms effectively contribute to the closer co-ordination of plans between these countries.

The new system of planning which greatly increases the economic independence of enterprises and trusts, consistent introduction of the *khozraschot* principle, extensive application of such important levers of economic stimulation as prices, credit, profit and bonuses add many

new features to the forms and methods of plan co-ordination and industrial specialisation. Economic factors and stimuli are beginning to exert an increasing influence on the development of production co-operation between CMEA countries.

STABLE RELATIONS AND THEIR ECONOMIC EFFECT

Socialist division of labour gives rise to the vitally important economic interdependence of countries participating in it. Practical experience shows that their economic development is increasingly determined by progress in reciprocal co-operation and the stability of the growing relations in international production specialisation and co-operation.

Economic relations between socialist countries are established on a planned basis and are not subject to the influence of spontaneous production and market fluctuations. Nevertheless, even in conditions of a planned economy a certain probability of internal and external economic risk must always be taken into account.

In international co-operation risks may be incurred by inadequately substantiated recommendations for specialisation, by non-fulfilment or essential revision of production plans, by price fluctuations, etc.

Needless to say, the extent of the international division of labour and its beneficial influence on socialist construction in each individual country depends directly on the degree of risk

involved. That is why the CMEA countries are seeking ways and means of making the new economic relations more stable and reliable. Side by side with perfecting the methods of plan coordination, they discuss measures to assist each country to carry out its obligations under agreements on specialisation, commodity exchange and co-operation in the construction of economic projects. To put it briefly, a profound study is made of the forms of economic and legal regulation ensuring the stability of exsting international relations.

Of fundamental significance for socialist economic co-operation is the problem of enhancing the economic advantage it can yield to each country. Of course, the demand for higher economic efficiency is not confined exclusively to international co-operation. Essentially, it determines the basic content of the economic policy of the socialist states at the present stage. The possibilities of extensively developing industrial production by employing additional manpower, by foreign loans, by increasing the share of accumulations in the national income and so on, which play a conspicuous part at definite stages of socialist construction, lose much of their significance with the passage of time. Further successes in economic development mainly depend on raising efficiency, which alone can provide the necessary means for bigger capital investments and higher living standards.

The CMEA countries' most vital interest now is to ensure that the division of labour between them should facilitate the maximun increase in the productivity of national labour and,

hence should increase the growth of industrial and agricultural production. However great is the role of economic co-operation in the political and ideological cohesion of these countries, it is most important to them as a factor making for higher productivity of labour in their own national economy, as a source of material benefits and of the advantages arising therefrom.

One could cite many examples in which the effect for all countries sharing one or another variant of the division of labour is self-evident, and does not require complicated proof. Practical experience shows that such variants are realised promptly. But there are also other examples, when the benefits are not so obvious but must be revealed by economic calculations and by carefully weighing numerous, often contradictory, arguments. But the lack of self-evident economic advantages by no means proves the absence of these advantages as such.

The practice of co-operation leaves no doubt that the progress in the division of labour between socialist states must rely to an ever greater extent on sound economic calculation. This is an effective instrument of planning and administration which enables us to discover and utilise ever new opportunities offered by international co-operation in production.

The main purpose of organising economic calculation in the relations between socialist states is to guarantee a fair distribution of the benefits derived from the division of labour and from production specialisation and co-operation between the countries concerned, rationally to co-ordinate and harmonise the interests of in-

dividual countries, and thus to promote the economic progress of the entire socialist community.

The Developing Countries and the Soviet Union

G. DEGTYAR, *Vice-Chairman, USSR State Committee for External Economic Relations*

During the past ten years the Soviet Union's economic and technical co-operation with the developing countries has been greatly expanded, its basic directions have been clearly defined, and its forms firmly established and strengthened.

During this period the Afro-Asian peoples have learned from their own experience that Soviet economic and technical co-operation is aimed at consolidating the political and economic independence of the emergent nations.

THE SCOPE AND MAIN TRENDS OF CO-OPERATION

In 1955 India and Afghanistan were the only developing countries to sign agreements on economic and technical co-operation with the USSR. Ten years later, in 1965, we had agreements and contracts with 29 Afro-Asian states, including Algeria, Afghanistan, Burma, Guinea, India, Iran, Iraq, the Yemen, Cambodia, Came-

roons, Kenya, Brazzaville Congo, Kuwait, Laos, Mali, Nepal, the UAR, Pakistan, Senegal, Syria, Somalia, the Sudan, Tunisia, Turkey, Uganda, Ceylon and Ethiopia.

As of January of this year the USSR was rendering economic and technical accistance to these countries in the construction of some 600 industrial enterprises and other major projects, including over 350 projects in Asian countries and about 250 in Africa.

To assist these countries in the financing of projects under construction, the Soviet Union granted them credits totalling more that 3,500 million roubles.

In terms of value, Soviet assistance to the developing countries is distributed among various branches of the national economy as follows:

	per cent
Industry and geological prospecting	71
Agriculture (including irrigation)	7
Transport and communications	9
Education, culture, public health and sports	4
Other branches	9

After the conquest of political independence, the developing countries of Asia and Africa were confronted with the task of eliminating the colonial economic pattern, putting an end to their economic dependence on the colonialists, and building up independent national economies as the only guarantee of genuine political independence. Since an independent national economy can be established only on the basis of indus-

trialisation, the developing nations' economic development programmes envisage the creation of their own industry, chiefly in the state sector.

Soviet agreements provide for assistance in the construction (including projects already commissioned) of more than 20 ferrous and non-ferrous metal plants and shops, 43 engineering and metalworking enterprises, about 30 power stations, 16 chemical plants and oil refineries, 60 light and food industry enterprises, as well as new capacities for the production of mineral fertilisers, cement, aluminium, cotton fabrics, metal-cutting lathes, etc.

More than half of all the commitments assumed by the USSR under its agreements with the emergent countries involve assistance in the establishment of heavy industry, notably iron and steel, engineering and power plants.

It is well known that Afro-Asian mineral resources are inadequately surveyed. The developing countries now consider it their primary task to develop and to make maximum use of their own natural wealth. Lacking the required experience, trained personnel and equipment, they turn to the Soviet Union for assistance in geological prospecting for minerals. Soviet geologists are now working in Algeria, Afghanistan, Guinea, India, Indonesia, Iraq, the Yemen, Brazzaville Congo, Mali, the UAR, Pakistan and Syria.

In recent years most of the developing nations have drawn up programmes for building up a diversified agriculture. Here also Soviet assistance is of vital importance. Upwards of 100 major irrigation projects, grain elevators and large state farms are now being built in these

countries with Soviet aid. The USSR is also rendering valuable assistance to a number of Asian and African countries in the construction of railways, motor roads, ports and radio stations.

TRAINING OF NATIONAL PERSONNEL

One of the most difficult problems the newly-free countries have to face in implementing their socio-economic development programmes is the acute shortage of skilled technical personnel. Under existing agreements, the USSR is assisting the developing countries in building some 90 educational establishments (institutes, colleges, secondary and vocational schools, and training centres), nearly 40 of which are already functioning. About 600 Soviet teachers and instructors are now working in higher, secondary and professional training schools in various developing countries.

Apart from rendering direct economic and technical assistance on a bilateral basis, i.e., under agreements with individual developing countries, the USSR also makes financial contributions to the UN Technical Assistance Fund. Between 1954 and 1965 Soviet contributions to the UN Expanded Programme of Technical Assistance and to the Special Fund exceeded 25 million roubles.

Soviet assistance to the developing countries under the UN programme includes deliveries of equipment and materials for integrated projects, the dispatch of Soviet specialists as UN experts and the training of citizens of the developing

countries in Soviet educational establishments.

The number of countries drawing on Soviet technical assistance under UN programmes is increasing from year to year. From 38 countries in 1960 it has grown to 80 in 1965. The number of Soviet specialists working as UN experts has risen from 47 to 162 in the same period, and the number of UN specialists from developing countries studying in the USSR has increased from 118 to 657. In the past three years 57 UN -sponsored international seminars and symposiums were held in the USSR at Soviet expense.

The Soviet Union's activity in organising the seminars and symposiums was greatly appreciated both by representatives of the developing countries and by the specialised UN agencies.

* * *

Payment for Soviet technical assistance is usually made by clearing as well as by medium and long-term commercial credits granted by the Soviet Union.

In conformity with existing agreements and long-established practice, the developing countries usually repay Soviet credits with their traditional exports, or with consumer goods produced by their national enterprises, including those built with Soviet assistance. This creates a stable guaranteed market for the sale of their produce and increases employment, thus contributing to higher living standards. It is important to note that this method of settlement enables the developing countries to save much-needed convertible currency.

The Soviet Union, on its part, receives from the developing countries industrial raw materials and consumer goods for the population: natural rubber, long-fibre cotton, wool, leather, cocoa beans, coffee, tea, tropical fruit and other commodities. Co-operation with Afro-Asian countries along these lines provides a good basis for further development and promotes the rational use of the advantages of the international division of labour.

Soviet economic and technical co-operation with the developing Afro-Asian countries contributes to broader and mutually beneficial trade. Between 1958 and 1964 the volume of Soviet trade with the developing countries increased by more than 50 per cent (from 646 to 1,053 million roubles) .

ELOQUENT RESULTS

A clear idea of the scope of our co-operation with the developing countries can be gained from the number of diverse projects built and commissioned in these countries with Soviet economic and technical assistance by the beginning of this year.

Among some 180 projects built in Guinea, Mali, Syria, the UAR, the Sudan, Somalia, Ethiopia, India, Burma, Nepal, the Yemen, Cambodia, Afghanistan, Iraq and Turkey there are industrial enterprises, transport facilities (motor roads, ports, airfields), state farms and other agricultural enterprises, cultural, service and educational establishments, medical institutions

(hospitals, research centres), apartment houses, etc.

Nearly 30,000 Soviet specialists were dispatched to these countries to assist in the construction and commissioning of the projects and to train national personnel. Upwards of 100,000 skilled workers and foremen have been trained in these countries during the past ten years and more than 20,000 have undergone practical training at Soviet industrial enterprises.

The developing nations fully realise and duly appreciate the value and significance of Soviet economic and technical co-operation. During his visit to the USSR on January 12, 1965, the late Prime Minister Shastri of India declared:

"I should like to express our gratitude for the essential economic support we received from the Soviet Union in the process of implementing our second and third five-year plans. The various plans and projects realised with Soviet assistance have done much to provide the basis for the economic structure which we intend to build in our country."

UAR President Gamal Abdel Nasser spoke as follows about co-operation with the Soviet Union:

"The people of the United Arab Republic will never forget the friendly assistance we received from the Soviet Government at all stages of our agreement on the Aswan High Dam.

"The people of the United Arab Republic will never forget the creative labour of Soviet engineers, workers and research institution, as well as the effort of Soviet industrial enterprises to

supply the project with the necessary equipment.

"The people of the United Arab Republic will never forget the industry and patience displayed by the Soviet personnel who worked together with their Egyptian brothers on the construction of the Dam."

"I should like to expess the deep satisfaction felt by the people of Guinea at promoting relations with the Soviet Union," said President Sékou Touré of Guinea. "These relations are based on broad reciprocity. We are grateful for the selfless assistance rendered by the Soviet Union. It has enabled us to carry out our three-year development plan and is helping us successfully to cope with the tasks of the seven-year economic development plan."

The economic and technical co-operation between our socialist state and the developing countries represents a new type of relations between states and nations. It is an important factor in creating a healthier international climate and strengthening peace, which exerts an ever-increasing influence on the process of historical development.

The five-year economic development plan of the USSR for 1966-70 provides technical assistance to the developing countries in creating their own national industry, agriculture, scientific and design organisations and construction facilities, and their own modern means of transport and communication. It also helps them to carry out geological prospecting, and to train specialists and skilled workers.

The high rates of growth of industrial pro-

duction, notably in the engineering and metal working industries (by 50-70 per cent), planned for the next five years, provide the necessary material conditions for successfully implementing important advances in economic relations with the developing countries.

Urgent Requirements of International Trade

A. BYKOV

The scientific and technical revolution at work in the modern world calls for freer international economic contacts and creates conditions for broad economic exchange between socialist and capitalist countries. This process, in turn, may have a beneficial effect on the international situation.

THE WAY TO BROADER ECONOMIC RELATIONS

Recently many West-European countries and Japan have been taking practical steps to extend economic and commercial relations with the Soviet Union. Despite serious obstacles artificially erected by the Western Powers, economic relations between socialist and capitalist countries are steadily developing.

In 1964, the volume of trade between socialist and industrially developed capitalist states

amounted to nearly 7,700 million roubles, as against 2,160 million in 1950 and 3,180 million in 1955. It was pointed out at the 23rd CPSU Congress that during the past five years the volume of Soviet trade with the capitalist countries, notably with Finland, France, Italy, Japan, Britain and Sweden, increased by more than 50 per cent.

Britain has always been well to the fore in the Soviet Union's trade with the Western countries. In 1959 the USSR concluded its first five-year trade agreement with Britain, under which the volume of trade between the two countries increased by 60 per cent, amounting to 310 million roubles in 1963. In April 1964 the agreement was prolonged for another five-year period.

Although the Soviet Union's trade turnover with West Germany is quite considerable (290 million roubles in 1964), it is far below existing possibilities of further expansion. This is chiefly due to a number of important policy issues that still remain unsettled, the blame for which does not rest with the Soviet side.

In the last few years significant progress has been made in Soviet-Italian trade, in which 1963 turnover totalled 245.5 million roubles, compared with 66.4 million in 1958. A good basis for this was provided by long-term trade agreements. The agreement for 1966-69, for instance, envisages a 50 per cent increase in the volume of trade over that of the preceding agreement (1962-65).

Very favourable prospects are opening up for Soviet trade with France, whose volume reached 215.9 million roubles in 1962. An important con-

tributing factor to its development was the conclusion of a long-term agreement for 1963-65. On October 30, 1964, the USSR and France signed a new agreement for 1965-69, providing for another substantial increase in the volume of trade.

Soviet-Japanese trade is rapidly expanding. Its volume has increased nearly tenfold since 1958, and amounted to 322.1 million roubles in 1964. As a result, Japan has become the Soviet Union's biggest trading partner among the leading capitalist states. Early this year, on January 21, the USSR and Japan concluded a new five-year trade and payments agreement providing for a substantial increase in trade turnover —from 360 million roubles in 1966 to 450 million in 1970.

It is thus obvious that many capitalist countries are displaying a growing interest in promoting trade with the USSR and other socialist countries.

Why this abrupt change in the trade policy of the capitalist countries which not so long ago fully approved the US-imposed boycott and trade discrimination against the Soviet Union and the world socialist system?

Since the '50s the US Nato allies began to realise that the artificial trade restrictions imposed on them could neither weaken the socialist countries economically and militarily nor prevent them from carrying out their economic development plans. Furthermore, the discriminatory measures indirectly contributed to broader economic co-operation between the socialist countries and to more intensive mobilisation of

their internal resources.

On the other hand, the discriminatory policies deprived Western firms of profitable markets and increased Western Europe's economic and political dependence on the United States. New sentiments began to emerge in the business community of the capitalist world. "The West has discovered a very valuable market in the European communist camp," wrote the Paris *Combat*.

Interviewed by *Süddeutsche Zeitung,* Herr Kroll, former FRG Ambassador to the USSR, spoke as follows about the heightened interest shown by the West in developing trade with the Soviet Union: "It is a well-known fact that the so-called policy of embargo, that is, of restricting Western deliveries of certain export commodities to the Soviet Union, has not prevented the Soviet Union, a predominantly agricultural country in the past, from developing into the world's second biggest industrial power. In the past few years the Soviet Union has gained amazing successes in automation and, above all, in nuclear research for peaceful and military purposes."

This situation impelled the leading capitalist states to renounce the policy of economic boycott and to seek broader business contacts with the socialist countries. Of all the US allies only West Germany continued, until recently, to stick to its policy of freezing trade with the socialist countries, while the other US Nato partners intimated in one or another way their opposition to the former "tough" policy in East-West trade. Britain's attitude was clearly expres-

sed by ex-Prime Minister Sir Alec Douglas-Home during his 1964 US visit, when he frankly told President Johnson: "We in Britain have to trade, we do not believe in boycotts." In other words, Britain has no intention to continue trade discrimination against the socialist countries because of their "political convictions."

As was only to be expected, this position of the British ruling circles prompted other Nato members to follow suit. We must follow Britain's example of lifting restrictions on trade with the East, they declared, for otherwise our firms won't be able to hold out in the competitive struggle for new markets.

OBSOLETE DOGMAS AND BUSINESS INTERESTS

The differences which arose between the policies of the Western states were manifested most saliently in their attitude to the question of granting credits to the socialist countries for the purchase of equipment. Under the 1958 Berne Agreement, it will be recalled, such credits can be granted only for five years. But living realities have shown the need for more favourable payment conditions for broader mutually advantageous deliveries of equipment, primarily of complete enterprises, in view of their high cost, and the long period required for their manufacture, assembly and putting into operation. That explains why many realistically-minded businessmen in the West have come to realise that in order to expand the export of producer

goods to the USSR and the other socialist countries it is imperatively necessary to revise the terms of the Berne Agreement. This realistic attitude is steadily gaining the upper hand.

The adamant US opposition to prolonging the term of credits granted to the Soviet Union is based on the claim that any deliveries of equipment to the USSR are tantamount to economic aid because they enhance its defence potential, though it is well known that this task is solved by the Soviet Union with its own resources at its perfectly equipped defence enterprises. The utter insolvency of such objections is well understood by many Western experts. Any restrictions on the export of equipment to the Soviet Union ultimately compels the USSR to launch its own production of the necessary items at the cost of certain additional outlays, while the West forfeits highly profitable orders.

The contract signed in London in September 1964 with the British *Polyspinners* firm for a terylene plant for the USSR worth £30 million is one of the biggest deals in the whole history of Anglo-Soviet trade. Moreover, it is backed by a financial agreement with the British Midland Bank providing for a fifteen-year government-guaranteed loan. In that same month an agreement was signed with Japanese firms for delivery to the USSR of a urea-manufacturing plant and for a long-term credit to cover the cost of the order. The example of Britain and Japan was soon followed by France, Italy, Holland and some other Western countries, which expressed their readiness to grant long-term credits to the socialist countries. Most of the Western Powers

are decidedly in favour of promoting trade with the socialist countries and of revising the existing credit terms.

Of the major Western capitalist countries only the United States continues to cling stubbornly to its old cold-war policy in trade with the socialist countries. But even the United States itself has been constrained, albeit with numerous reservations, to introduce certain new elements in this policy. If all the other Western allies are prepared to trade with Moscow without any restrictions and if this can yield good profits, the *New York Herald Tribune* wrote more than a year ago, then the United States too must get its share of profits. It should try, in effect, to get the lion's share, the paper added.

In a comparatively short period the US Chamber of Commerce, ex-Secretary of Commerce Hodges, a group of US businessmen who took part in the Moscow Round Table talks, and many other influential representatives of the business community, came out in favour of normalising Soviet-American trade.

It was evidently the appearance of such sentiments that compelled President Johnson to declare in his last year's State of the Union message that the US Administration "is studying ways and means of expanding trade with the Soviet Union and other socialist countries."

The Soviet Union's readiness to participate more actively in world trade and the international division of labour, expressed at the 23rd CPSU Congress, compelled the US business community to press more insistently for normalisation of Soviet-American trade relations. The

New York Times, for one, hastened to declare editorially earlier this year that American businessmen must enjoy at least the same opportunities as Western Europe and Japan to conclude business transactions with the Soviet Union and Eastern Europe.

The elimination of artificial restrictions on trade with the socialist countries, and renunciation of the present aggressive policy towards some of them would make it possible substantially to expand the volume of East-West trade in the near future. The long-term character of the socialist countries' trade agreements with most of the capitalist states, the planned development and high rates of economic growth of the socialist countries create a firm basis for broader trade with them. The 23rd CPSU Congress Directives thus open up wide prospects for the development of mutually advantageous trade relations.

* * *

The new alignment of world forces in favour of socialism dictates new conditions of economic co-operation between states and peoples. One of these conditions is the development of trade between all countries on a basis of equality and mutual advantage. It has been borne out by many years of experience that the Soviet Union and other socialist countries are highly reliable trade partners, whose good will and creditworthiness are beyond any doubt. They are willing to develop equal and mutually bene-

ficial trade with all countries, irrespective of differences in social systems.

The whole history of the economic relations between socialism and capitalism confirms the correctness of Lenin's brilliant thesis that "there is a force greater than the desire, will or resolve of any of the hostile governments or classes. That force is the general, world-wide economic relations which compel them to do business with us."

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